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Volume 29 Number 2

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Wild Madagascar

Dancing lemurs, colourful chameleons and fierce fosas: enter a wildlife wonderland



IBERIAN LYNX

Why hope for the world's rarest cat rests with the rabbit

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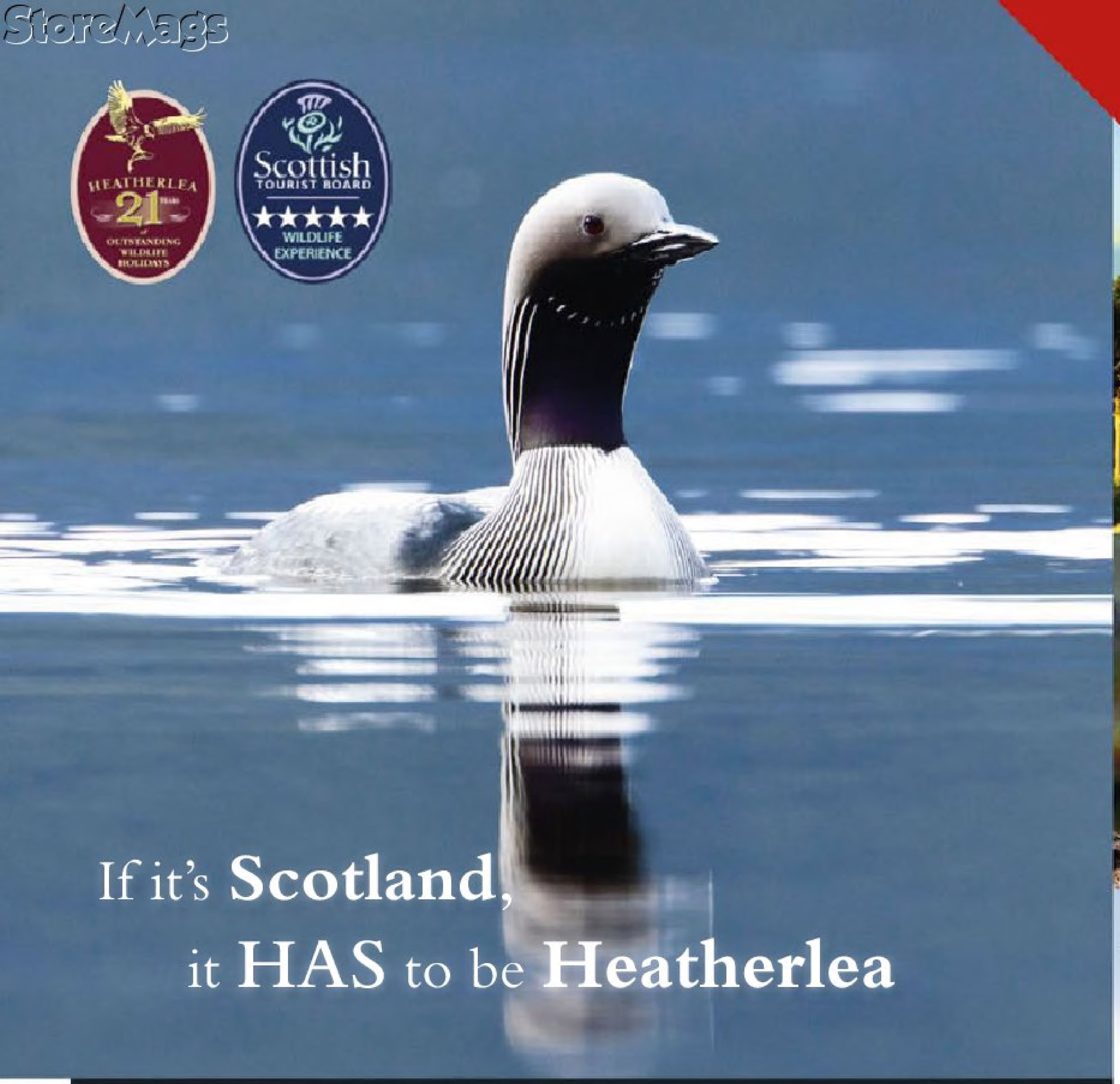


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WILD MADAGASCAR
Not just lemurs: meet the menagerie that makes this Indian Ocean island unique.



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INDIA IN MONOCHROME
The subcontinent's iconic animals as you've never seen them before.



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IBERIAN LYNX
"Until our lynx have reproduced in the wild there is no hope for the species." Astrid Vargas

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COVER Cyril Ruoso/Minden/FLPA
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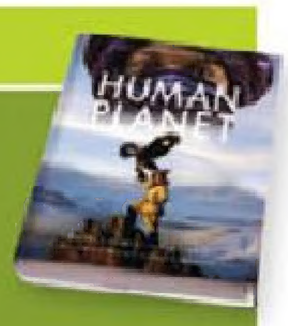
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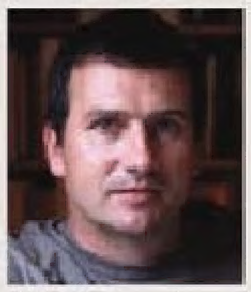
NILANJAN DAS
The jungle look, p18
By day, Nilanjan works in health care, but when he's not in his lab he spends all his time working with his camera. "Photography is about telling the simplest of stories in a language easily understood by all," he says, "but I still have so much to learn – about both photography and the natural world itself."



NICK GARBUTT
Wild Madagascar, p42
Nick has been visiting Madagascar for nearly 20 years and has been to almost every corner of the island. He says, "I've had my boots chewed by a fosa, eaten roasted locusts, been infested by parasites, caught malaria three times and become addicted to Malagasy chocolate!"



PETE OXFORD
Iberian lynx, p54
Pete couldn't believe it when the Wild Wonders of Europe project assigned him the rarest cat in the world – the Iberian lynx. "After three months in the field, I had become intimate with a special individual that knew and trusted me," he says. "It was one of my greatest natural experiences."



MARK COCKER
In praise of song, p60
Mark has been addicted to birdsong for 40 years and measures the seasons with their sounds. Winters at his Norfolk home are defined by the high, wild, whistling notes of local wigeon. "For me, spring begins as soon as I hear my favourite sound in all of nature – the soft, leaf-green music of singing blackbirds."

Fantasy island

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Enjoy 12 issues for the price of 8 – that's four free issues – when you subscribe by Direct Debit today (p40).

DISNEY COULD NOT have dreamed up a more magical kingdom than Madagascar. This enchanted island is home to a cast of characters as colourful as they are bizarre.

The lemurs, of course, take centre stage. Not content with ruffs, stripes and blazing eyes, they leap from tree to tree with acrobatic artistry. The indri sings like a whale and the limelight-hogging Verreaux's sifaka dances across the ground in a comical sideways gallop.

Fat red and black millipedes tap their many-legged way up tree trunks; giraffe-necked weevils wait under every leaf, looking as if they just need the right tune to burst into song; and colossal Madagascan moon moths dangle like chandeliers from the foliage.

A chorus line of tiny spotted mantella frogs seems to have escaped from a bag of gummy sweets, and startled leaf-tailed geckos appear as if by magic on trunks, striking dramatic poses, tails brandished like rapiers, red mouths agape.

And here be dwarves and giants of the chameleon world, from the itsy-bitsy *Brookesia* to the heavyweight Parson's.

At night, the forest is sprinkled with the fairy lights of glow-worms, while spiky, hedgehog-like tenrecs stomp through the leaf litter like grumpy gnomes.



"Giraffe-necked weevils just need the right tune to burst into song."

This isolated paradise was once home to the largest bird ever to walk the planet: the proof is a giant fossilised egg – that of the long-extinct elephant bird – that sits in Sir David Attenborough's house. No surprise, then, that the BBC has produced a lavish series about this, one of the world's most important biodiversity hotspots.

Yet Madagascar is under threat, its rich forests logged for timber and charcoal, its ruby-red soil eroded, unique ecosystems burned, seas plundered and magical wildlife stolen for the pet trade. So, before it is too late, explore one of the planet's most extraordinary places with us (**p42**).

ALSO THIS MONTH, Pete Oxford finds out what a 'rabbitat' is (**p54**), Mark Cocker waxes lyrical over birdsong (**p60**) and Kenny Taylor tracks down Scotland's beavers (**p84**). Plus, the wildlife of India as you've never seen it before (**p18**) and how to choose the best pictures to help you win the Veolia Environnement Wildlife Photographer of the Year competition (**p67**). Enjoy!

Sophie

Sophie Stafford, Editor

Our official website www.bbcwildlifemagazine.com has moved to www.discoverwildlife.com

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SNOWDROPS

Snow drifts

Swathes of snowdrops, climbing the sides of shady dingles or spilling out of copses onto road verges, are a welcome sight in February. But in many places these fragile-looking flowers bloom so far ahead of the vanguard of violets, primroses and wood anemones that they stand accused of deception – false messengers heralding a spring that may not take hold until later this month (see p10).

Their French name is *perce-neige* or 'snow-piercer', a tribute to the plants' hardiness and tough leaf-tips. Indeed, France could be their nearest native home, for some experts claim that British snowdrops are introduced (though others argue that they have been here all along). The first records of wild specimens were in the 1770s from Gloucestershire and Worcestershire, where I've seen sprouting bulbs bobbing in flood waters. This is often how the flowers spread, downstream from riverside gardens, the bulbs rooting easily in silt left by the receding waters.

Laurie Campbell

FIND OUT MORE

To see a time-lapse video of snowdrops blooming visit www.bbc.co.uk/nature/life/Galanthus_nivalis

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HIGHLIGHTS FEBRUARY



Our pick of the wildlife spectacles to enjoy in Britain this month

WITH BRETT WESTWOOD

Naturalist, writer and BBC radio presenter

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HIGHLIGHTS FEBRUARY

THREE TO SPOT

CATKINS



Dave Bevan

▲ This month, the ALDER's maroon catkins start to lengthen among the clusters of last season's miniature cones. Healthy trees put on a luxuriant display, but in recent years many alders have been stricken with a canker that is often fatal. Another more benign fungus associated with alders is the delicate brown *Ciboria amentacea*, which grows on the ground on last year's decaying catkin crop.



Ross Hoddinott

▲ The 'lamb's-tail' catkins of HAZEL appear in autumn, but are at their best by February. They are the male flowers and waft a shower of yellow pollen onto the crimson female blooms, which are poised on twigs like tiny sea anemones. The catkins soon wither, but the fertilised flowers will expand throughout spring and summer to form cobnuts, enclosed in a sheath of ragged green bracts.



Ross Hoddinott

▼ Pussy willow catkins are the male flowers of the SALLOW, and in February their silvery down erupts into a fuzz of golden anthers. They appear before the leaves and pollinate the duller green catkins that grow on female trees. In late winter, the catkins are a life-saving food source for the first bumblebee queens emerging from hibernation.



Steve Round

If you're lucky, you may spot a tawny owl sunbathing out in the open in warm sunshine.

TAWNY OWL

Owls on the prowl

ON STILL February nights, tawny owls are busy staking out their territories. William Shakespeare, wordsmith that he was, had trouble sexing these charismatic but elusive birds, and in *Love's Labours Lost* wrote, "Then nightly sings the staring owl:/ Tu-whit, tu-whoo – a merry note,/While greasy Joan doth keel the pot."

We now know that tawny owls duet, the male following the female's shrill 'ke-wick' with a long, quavering hoot in two parts. A dramatic silence is then followed by a second call and response. The female sometimes cries from inside her tree-hollow nest while sitting on her clutch – a signal for the male to fetch more prey.

These are stocky, broad-winged, mostly brown owls of wooded areas, but they have adapted well to life in leafy town gardens – their daytime hideaways are often betrayed by the angry 'mick-mick' calls of mobbing blackbirds. They lay two to four eggs in late March or April, and the incubation takes about a month; in Germany at least, it appears that urban nests tend to be the earliest.

The fluffy owlets are fed on mice, rats and small birds, though some parents bring in earthworms, beetles, frogs and even fish. Tawnies are known for defending their nests vigorously – the species has been described as Britain's most aggressive bird. Eric Hosking, the late wildlife photographer, called his autobiography *An Eye for a Bird*, having lost one of his eyes to a defensive individual.

FIND OUT MORE

Learn more about tawnies and other British owls at www.hawkandowl.org/Species/Owls

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IMPROVE YOUR NATURE PHOTOGRAPHY

This month, pro photographer Paul Hobson explains how he got his best winter action shot – and shares his top tips.



THE PHOTOGRAPHER

PAUL HOBSON runs trips and workshops, and lives near Sheffield.

I love photographing hares, and a dusting of snow can add a dramatic wintry feel to any image. The farming area just outside Derby, a little south of the Peak District, is excellent for brown hares – the scattering of small woods and hedge-fringed fields of rough grass and crops provides ideal habitat for them.

A late-winter morning saw me staking out my favourite spot. I had already captured a number of static hare shots on previous visits; on this chilly morning I was hoping for some action – and I wasn't disappointed.

HOW I DID IT

Arriving just before dawn, I noticed three hares chasing each other around the fields. I steadied my camera on a beanbag on a little sledge and belly-crawled towards the cavorting animals. Over the course of 20 minutes I edged closer; the hares seemed oblivious to my presence.

Suddenly they were spooked by the appearance of a distant fox. I was lucky – in their panic, they ran straight towards me. I locked onto the lead hare and let the motor wind rip as it sprinted past. Using a fast shutter speed (1/1250 sec) and a low aperture (f5.6) I was able to freeze the action but blur the background. The moment lasted a couple of seconds, then the hares were gone – pure magic!

WHY THIS PICTURE WORKS

- The low sun bursting through the trees at the edge of the wood on the right bestows a magical quality on the image, capturing the true essence of winter.
- A fast shutter speed freezes the flurries behind the animal's hindquarters as it runs past, giving a sense of its feet digging into the snow.
- The low perspective creates a feeling of intimacy and blurs the foreground and background, helping to accentuate the hare's speed.

www.paulhobson.co.uk

PAUL HOBSON'S TOP TIPS FOR BETTER WILDLIFE SHOTS

GET DOWN LOW

Use a beanbag or choose a tripod that opens out completely. Shooting from close to the ground will let your lens see the world as the animal perceives it. A low point of view also adds blur both in front and behind the subject, which helps to isolate it and intensify the image's impact.

SUSS OUT YOUR SITE

Seek advice on the best spots from local naturalists or farmers – they will often pass on secrets that will save you hours of pointless waiting. However, in the long run, you must put in the time to develop your fieldcraft. Then you'll learn how the animals will behave, and when and where to spot the best behaviour.

FIND THE PATH LESS TRODDEN

Don't just follow the well-worn route to the overused honeypot sites. Though there is always a place and time to visit those popular spots, do not neglect your own backyard. I get most of my best images from working locally, often in the same place.

GO MICRO

Spend hours on one subject, and stop regularly to review your work. I recently photographed a spider on some fruiting lichens. The scene was only a 30cm-long stretch of branch; I spent four hours trying as many angles and camera settings as I could, and only captured the best images towards the end of the session.

READER CHALLENGE WINTER WILDLIFE ACTION

We want to see how you've put Paul's tips into practice. Send us your best shots of animals in action during the winter, and the most striking may be published in the Your Photos section (see p110). Send your images to wildlifephotos@bbcmagazines.com or to the address on p5.



Snow presents the wildlife photographer with a great opportunity to take dramatic images.

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ID PARADE

Signs of spring

SOMEONE HAS calculated that spring in the UK unrolls northwards at about 3km a day, which means that a leisurely amble should guarantee a continuous carpet of unfurling violet and primrose buds for several months. It's a good headline-grabber, but, of course, the nature of our countryside produces a fickler spring more dependent on altitude, soil types, weather patterns and the idiosyncrasies of individual species.

For example, the spring leafing of hawthorns varies not only from hedge to hedge, but from plant to plant – green-decked shrubs rub branches with others still obstinately in bud. And what, for instance, are we to make of the precocious variety of Glastonbury thorn *Crataegus monogyna* that is often in bloom at Christmas?

The UK Phenology Network, a growing community of amateur and professional naturalists spearheaded by the Centre for Ecology and Hydrology and the Woodland Trust, revels in the first (and last) sightings of many British plants and animals. Phenology is the study of how climate change affects the timing of natural events, such as the appearance of frogspawn, the flowering of blackthorn or the emergence of peacock butterflies.

By pooling sightings from around the UK, it has shown that, on average, spring begins 11 days earlier now than 30 years ago. These days we expect to find frogspawn in the south-west before the year is out, and red admiral butterflies on the wing in February. Though the past two winters have led to later springs than has become the norm, the overall trend is still for higher temperatures and earlier sightings of spring wildlife.

GET INVOLVED

The Woodland Trust and the Centre for Ecology and Hydrology have set up The Nature's Calendar Survey for members of the public to record their sightings online. Volunteers can register for their starter packs at www.naturescalendar.org.uk



Grey squirrel

SCIURUS CAROLINENSIS

Males pursue females through the treetops at full speed, accompanied by swishing tails and scolding calls.



Great spotted woodpecker

DENDROCOPOS MAJOR

Males hammer their bills loudly on tree trunks to establish territories.



Rook

CORVUS FRUGILEGUS

Pairs begin to rebuild last year's nests in bare treetops. Squabbles over stolen twigs are common.



Black-headed gull

CHROICOCEPHALUS RIDIBUNDUS

Both sexes acquire smart chocolate hoods that contrast with their white eye-rings and crimson bills.



Grey heron

ARDEA CINEREA

Males display to mates with head and breast-hackles raised, and their bills flush red at the base.



Horse chestnut

AESCULUS HIPPOCASTANUM

Treacly buds appear, swollen with the pleated, five-fingered leaves and embryonic flower spikes.



Brimstone butterfly

GONEPTERYX RHAMNI

Feeds from early-flowering plants such as primroses. Often the first butterfly to be seen in spring.



Herald moth

SCOLIOPTERYX LIBATRIX

After a winter in caves and cellars terrorised by spiders, survivors emerge to feast on sallow blossom.



Seven-spot ladybird

COCCINELLA SEPTEMPUNCTATA

One of the first insects to emerge in spring from its winter lodgings in dead stems or behind bark.



Smooth newt

LISSOTRITON VULGARIS

Like tiny dragons, males posture for the plainer females, quivering their tails in an elaborate dance.



Frogspawn

RANA TEMPORARIA

Masses of frogspawn appear in ponds. Few of the eggs and subsequent tadpoles will survive.



Sweet violet

VIOLA ODORATA

In flower this month. Unlike the dog violet, it spreads by means of runners, forming large patches.

Illustrations by Sandra Doyle/the-art-agency.co.uk

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Craig Jones

This bedraggled short-tailed vole is taking a risk by leaving its hidden network of crawl ways.

SMALL MAMMALS

Flood warnings

AS RISING February flood waters spill over washlands and pour across flood meadows, they force small mammals such as short-tailed (field) voles, woodmice and shrews onto higher ground. Those with an escape route scamper free, but any marooned on ever-decreasing islands of grass are forced to take the plunge as the waters close in.

Though these rodents can swim, they are most reluctant to do so. Waterlogged fur is a serious problem for small mammals, since it makes them even more susceptible to the cold. Moreover, there are many predators ready to take advantage of prey forced into the open during daylight hours.

In *Birdwatchers' Year,* published in 1973, Jeremy Sorensen, then a warden at the Ouse Washes, gives an atmospheric account of flood waters creeping across the low-lying ground at a rate of about 8cm a minute, pushing small mammals onto drier havens. In just half an hour, he rescued nearly 50 short-tailed voles and six common shrews from a small area (a tiny fraction of the animals affected), later releasing them safely elsewhere.

This is a perilous time. The flood-water margins are patrolled by flocks of black-headed gulls seeking drowned worms, but they are not averse to a small mammal or two. Kestrels hover overhead, looking for fleeing rodents, and in the late afternoon short-eared owls emerge to fan silently over the grass-heads, plunging into the tussocks at the first hint of prey. Grey herons often form silent covens at the edges of the flood, waiting for moles to break cover from their drowned burrows.

Only when the waters recede will the mammals be able to return to their former haunts.

BLUE TITS MISSING OUT

Hardly anyone who has ever put out food for garden birds will have failed to attract blue tits, but numbers of these wonderful acrobats are falling. The Garden Bird Feeding Survey run by the British Trust for Ornithology (BTO) has found a 42 per cent decline in blue tits over the past 40 years, with a marked drop during the winter of 2009–10.

The BTO believes that changes in the way we feed garden birds could be the problem. Blue tits are both small and dexterous, reaching foods that other species cannot exploit. But modern feeders are designed for all, so less agile species are benefitting at the tits' expense.



Danny Green

THREE TO SPOT

EARLY SPRING FLOWERS



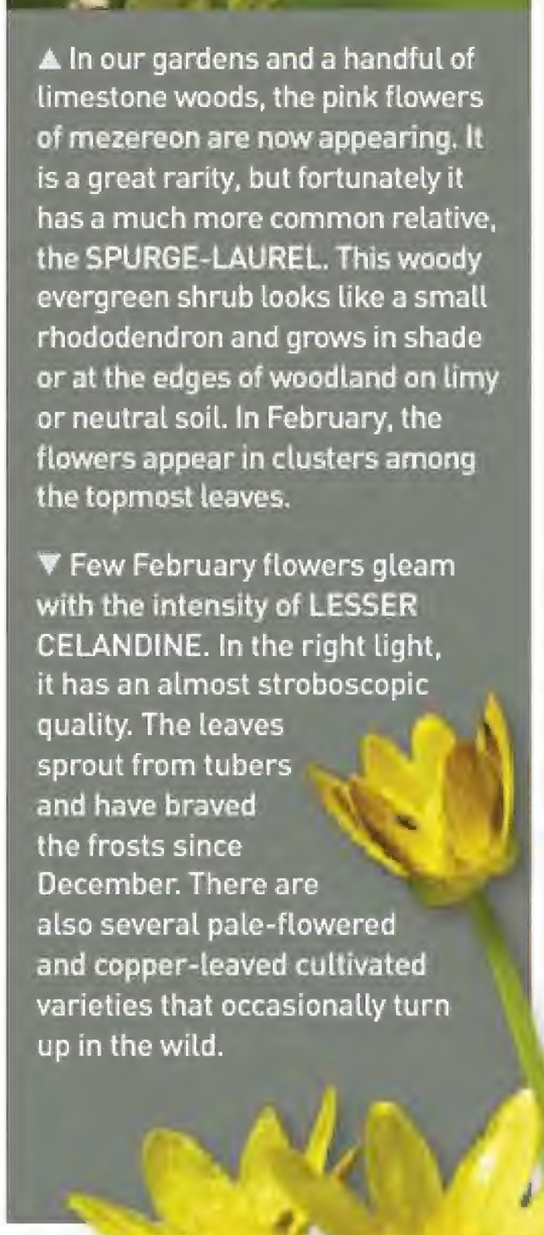
Ottmar Diez/Bon Appetit/Alamy

▲ The scaly-stemmed blooms of COLTSFOOT appear before its broad leaves. This plant often pops up on waste ground, and can prise its way through cracks in tarmac and rubble. It has long had a reputation for alleviating coughs – coltsfoot sweets were once sold in the Black Country as a potential cure. The sunny flowers are also a firm favourite with the first generation of honeybee workers.



John Bebbington

▲ In our gardens and a handful of limestone woods, the pink flowers of mezereon are now appearing. It is a great rarity, but fortunately it has a much more common relative, the SPURGE-LAUREL. This woody evergreen shrub looks like a small rhododendron and grows in shade or at the edges of woodland on limy or neutral soil. In February, the flowers appear in clusters among the topmost leaves.



Jason Smalley

▼ Few February flowers gleam with the intensity of LESSER CELANDINE. In the right light, it has an almost stroboscopic quality. The leaves sprout from tubers and have braved the frosts since December. There are also several pale-flowered and copper-leaved cultivated varieties that occasionally turn up in the wild.

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Waxwing

SOME KEEN birders measure their lives by waxwing invasions, and the one that began in late October 2010 was spectacular. Flocks of up to 1,000 birds were reported in north-east Scotland in autumn, and soon smaller groups began filtering down into northern and eastern England. Parties were also seen in the south and west, but progress was relatively leisurely because there was no shortage of berries in the north.

One place where food was hard to find was Fair Isle, where an enterprising resident and his son went 'fishing' for waxwings with apples tied on sticks. Several birds even fed directly from their hands – an amazing sight.

The jazzy Scandinavian berry-plunderers, with their improbable coiffure, are all the more welcome because, for many of us, they are not an annual feature in the British Isles. Invasion years, triggered by a scarcity of berries in northern Europe, are fondly remembered. The biggest recent irruption before this winter was in 2004–5, when waxwings swarmed into the strangest of places. In January 2005, I counted 100 in a rowan tree on a West Midlands high street.

Once a flock has found a good source of berries, it will stay until the fruit is gone. Waxwings are rapacious eaters – in *Birds Britannica*, Mark Cocker mentions an individual that devoured 600–1,000 berries in just six hours, defecating every four seconds.

HOW TO FIND WAXWINGS

- Rowan berries are the favourite winter food of waxwings, so checking groups of rowan trees is a good start. The birds also love the berries of *Cotoneaster* and *Pyracantha* bushes.
- All three of these species are often planted around housing estates and car parks and on road verges, so these are excellent places to look.
- Waxwings are less common in the countryside, but visit hawthorn hedges and apple orchards where fruit has been left on the branches.

WAXWING FIELD TIPS

- Waxwings are smash-and-grab merchants. They sit on tall trees, roofs and tv aerials near to feeding sites, then descend *en masse* to feed for several minutes, before returning to their perches.
- You'll sometimes hear the birds first – their calls are delicate, silvery trills.
- When perched, waxwings are dumpy, starling-sized birds with long Mohican crests.
- In flight, they look similar to starlings, but the yellow band at the tail tip gives them away.

FIND OUT MORE

www.discoverwildlife.com/blog/waxwing-lyrical



M Watson/ardea.com

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Waxwings are infrequent visitors to mainland Britain, but when they do come they arrive in force.

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HIGHLIGHTS FEBRUARY



David Tipling/NHPA

JAPAN

Eagles on ice

Sea ice arrived off northern Hokkaidō in January, bringing the area's Steller's sea eagles down to the coast. Come late February, numbers of these huge raptors reach a peak. Perched out on the floating platforms of ice, or flapping heavily overhead, their striking white markings and massive yellow bills distinguish them from the white-tailed eagles that also gather here. They're bigger, too: at nearly 9kg, they are the world's heaviest eagles.

Steller's sea eagles breed around Russia's Kamchatka Peninsula, before heading south to Japan in winter to enjoy the fishing. Cod congregate in the Rausu Sea and Nemuro Straits, and the eagles swoop down to pluck them from the frigid waters – or squabble over the spoils from the nearby fishery.

FIND OUT MORE

www.fadr.msu.ru/o-washinet/spsynop.html



Michael S Nolan/SpecialistStock.com

MEXICO

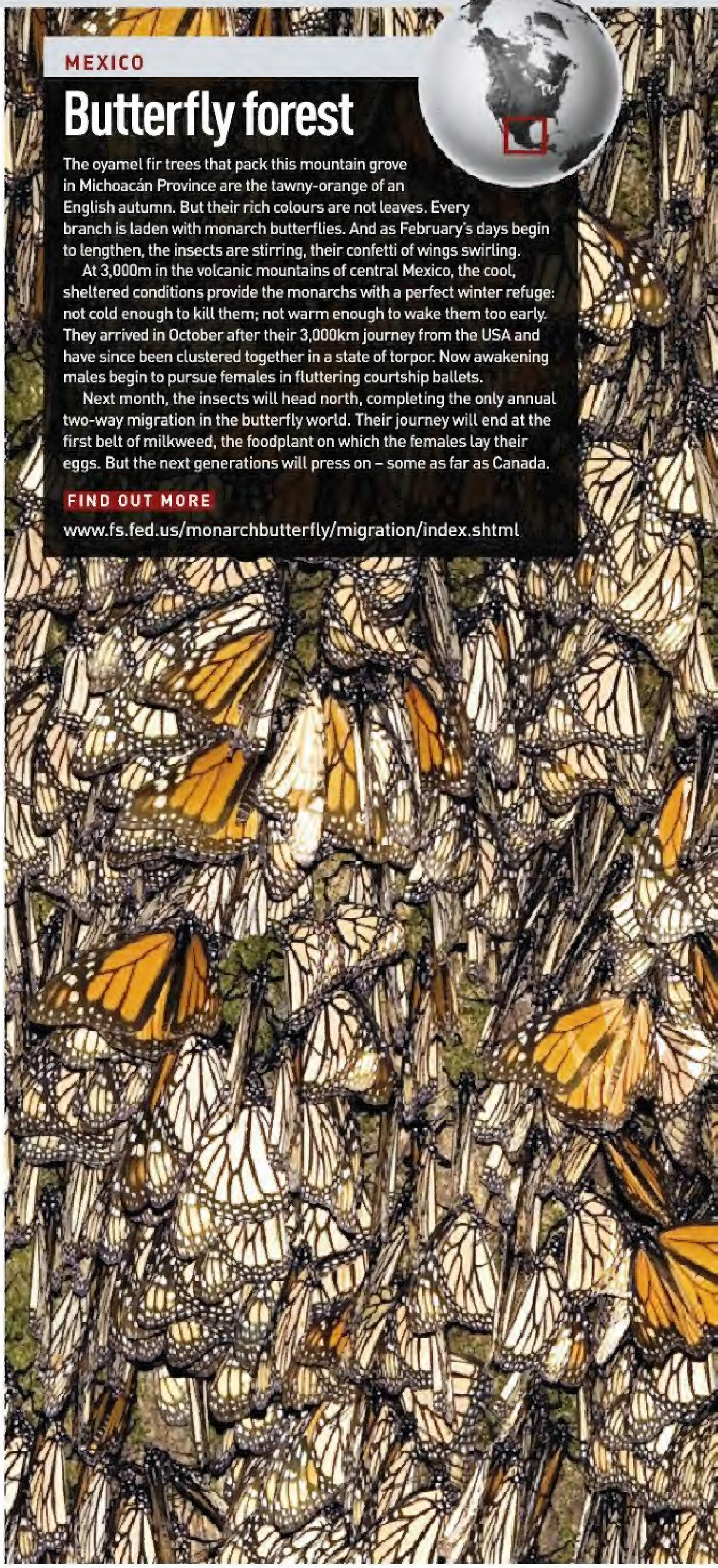
Whale nursery

Thousands of grey whales throng in the warm, shallow lagoons of Baja California this month, their great, knuckled backs breaking the surface and tail flukes raising a signature salute. Some breach, flinging their 35-tonne bulk clear of the water in an explosion of spray. Others approach boats and 'spy hop' for a better view, revealing creamy baleen as they lift their mottled snouts clear of the surface.

These cetaceans make one of the longest mammalian migrations: a 20,000km round trip between their summer feeding grounds off Alaska and their breeding areas off Baja. Here, conditions are perfect for nursing newborn calves, which fatten up with insulating blubber in readiness for their first journey north in March and April.

FIND OUT MORE

www.acsonline.org/factpack/graywhl.htm



Ingo Arndt/Minden/FLPA

MEXICO

Butterfly forest

The oyamel fir trees that pack this mountain grove in Michoacán Province are the tawny-orange of an English autumn. But their rich colours are not leaves. Every branch is laden with monarch butterflies. And as February's days begin to lengthen, the insects are stirring, their confetti of wings swirling.

At 3,000m in the volcanic mountains of central Mexico, the cool, sheltered conditions provide the monarchs with a perfect winter refuge: not cold enough to kill them; not warm enough to wake them too early. They arrived in October after their 3,000km journey from the USA and have since been clustered together in a state of torpor. Now awakening males begin to pursue females in fluttering courtship ballets.

Next month, the insects will head north, completing the only annual two-way migration in the butterfly world. Their journey will end at the first belt of milkweed, the foodplant on which the females lay their eggs. But the next generations will press on – some as far as Canada.

FIND OUT MORE

www.fs.fed.us/monarchbutterfly/migration/index.shtml

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WORLDWIDE WONDERS

What's going on around the world this month – with MIKE UNWIN





Richard Du Toit/naturepl.com



BOTSWANA

Savuti Marsh stands on the site of a primeval lake north of the Kalahari. By February the rains have turned this dusty depression into a salad bowl and PLAINS ZEBRAS trek through the surrounding mopane woodland to graze on the lush sward. This year, with the lost Savuti Channel flowing again for the first time since 1982, huge herds are expected.



Jean Paul Ferrero/arrdea.com



NEW ZEALAND

The NORTHERN ROYAL ALBATROSS colony at Taiaroa Head, on New Zealand's Otago Peninsula, is the only breeding colony of any albatross species on a human-inhabited mainland. Females produce one egg every two years, and the last of them are hatching now. The chicks will fledge in September or October and will not return to breed for eight long years.



G&M Moss/SpecialistStock.com



BRAZIL

The PANTANAL swells into the world's biggest wetland in February. Just four months ago, animals congregated at dwindling pools, wary of lurking jaguars. Now the aquatic residents, from capybaras to caimans, disperse across the inundated terrain, while terrestrial creatures, such as howler monkeys and armadillos, cram onto islands of higher ground.

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Store/Kegg

A BRUSH WITH NATURE

RICHARD MABEY

Warm and witty, David Nash's enthralling sculptures harness the natural strength and spiritual power of wood.



IF YOU NEED warming up this winter, there's still time to visit David Nash's tremendous retrospective exhibition at the Yorkshire Sculpture Park (on until 27 February), which is as full of heat and hypnotic shapes as a log fire. It's worth going just to see the *Oculus Block*, a giant torso of wood with its thighs akimbo and shoulders flaunted at the wind. It is made of eucalyptus, one of the planet's most flammable trees, which heightens the sense that it might, at any moment, explode – as eucalyptus do in bush fires in Australia – liberating some ancient wood god.

Nash is a different kind of environmental artist from, say, Andy Goldsworthy or Richard Long. He's an aggressive interventionist, acting on wood in the same ways as natural forces – splitting, warping, charring, cracking open. One of his earliest and best-known pieces is *Ash Dome*, made in 1977 at the height of the Cold War. He once explained to me that he sensed "a feeling in the air that we might not see the end of the century, and wanted to make an act of faith in the future". So he planted 22 ash saplings in a circle, and by constant bending, pruning and grafting coaxed them into the shape of a living dome. It has been a decades-long dialogue with the trees, as they constantly attempt to break free of the dome to become a kind of 'Ash Spire'.

Nash adores wood and, like the Chinese, regards it as the fifth element – a melding of air, sun, earth and water that transcends the qualities of each. He's fascinated by the vivaciousness of its life, by its knobs and knots and sinews, by the incorporation of time in its grain. And also by its florid processes of ageing – its crumblings and fungal familiars that make 'dead' an absurd word to apply to a tree.

But he also acknowledges that humans are in thrall to trees and the wood that comes from them – and not just as a renewable resource. Throughout human history, trees have been symbols of liveliness and the protean power of nature to make endless forms. They lift us, spiritually oxygenate us, by their regenerative abilities and wonderfully obstinate resilience. Nash's art, which physically emphasises these qualities, can be seen as a way of dramatising what a harmonious relationship between humans and trees might be like.



Chain saws may not be the usual tools of an environmental artist, but in the hands of David Nash, powerful sculptures emerge from natural wood. Here, he is pictured with a work in progress, *Black Sphere*; *Red Column* is in the background.

So when I first visited his studio in Wales, I was mildly shocked to see six chain saws lined up in echelon against the wall. Not the usual trappings of a tree-lover. Nash explained that he liked to sketch the work out quickly, and talked of the importance of "feeling the tool work with your body".

Out of this muscular engagement come sculptures that have the heft and fluid mass of trees themselves. Nash's series of *Vessels* dance along the boundaries between nature and culture like initials carved in bark. They're a response to the lip-like wounds that open naturally on tree trunks, but also echo the shapes of native Australian bark boats.

His *Running Tables* are precisely that – the most basic of human artefacts kitted out with bosky limbs, making them look as if they might race off from the picnic site like mischievous deer.

There's also a lot of wit in Nash's work. One piece that is not physically in the show (because it is somewhere in the Atlantic Ocean) is *Wooden Boulder*. Back in 1978, Nash was given a large riverside oak tree, which he used as his first 'wood quarry', making several sculptures from it. The biggest was a block that he faceted with a chain saw on-site in north Wales until it was almost spherical. He thought that he would transport it back to his studio by floating it along a succession of pools and waterfalls. But nature had other ideas.

The block got stuck among rocks, and over the next 20 years made erratic progress downstream, washed on by storms, getting trapped in ice, crashing down fences after floods. The last I heard, in the winter of 2003, was that it had, at last, escaped into the Irish Sea – now re-imagined by Nash as a wild boulder, working to its own agenda, not his.

That is one of the strengths of Nash's work. Whatever he does to it, the wood has the final say. It answers back.

For more details of the exhibition, see www.ysp.co.uk

"Throughout human history, trees have been symbols of liveliness and the protean power of nature to make endless forms."

RICHARD MABEY has contributed columns to *BBC Wildlife* since 1984. Order his latest book, *Weeds*, on p80 (RRP £15.99, reader price £14.99, subscriber price £13.99) quoting code W0211/09.

Jonty Wilde

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The brown lemur is just one of many fascinating endemic species leaping, crawling and flitting through Kirindy Forest Reserve.

From top: Iñaki Relanzón/www.photosfera.com; Lance Woolaver/Durrell; Fidy Bruno Rakotomanana/Durrell

MADAGASCAR
GREENING THE RED ISLAND

Durrell celebrates 25 years of conservation success.

The Red Island of Madagascar – so called for the colour of its iron-rich soils – is a wondrous yet desperately poor country. The island's unique flora and fauna, which consistently amaze all who experience them, have become restricted to pockets of remaining forests or wetlands.

Most of Madagascar's population live around these tiny fragments; surviving on less than £1.25 a day, they are reliant on nature. Durrell Wildlife Conservation Trust has dedicated the past 25 years to working with local communities, to find ways of sustainably using the environment that protect species and raise the people's standard of living.

Join us to celebrate our 25th anniversary: www.durrell.org/madagascar25

In 1986 we began working to protect the world's rarest tortoise, the ploughshare. Since then we have bred more than 200 tortoises and started releasing them into Baly Bay National Park, created for this species. Through partnerships with the local communities we have also helped them to improve local primary education, health and livelihoods in a way that reduces the impact on the tortoise's habitat. Now the villagers have started their own patrols to protect the remaining habitats and the wild tortoises.

This partnership is key to conservation in Madagascar; we are repeating it in our eight field sites around the country for species such as the giant jumping rat, the Alaotra gentle lemur and the Madagascar pochard.

Madagascar needs your help more than ever. Both people and wildlife are struggling to survive as remaining forests and wetlands continue to get cut down and converted. Help us make a difference.

● *Support our mission in Madagascar: visit www.durrell.org/donate*

Baly Bay National Park was created to protect ploughshare tortoises.



Partnerships with local communities encourage grass-roots conservation.

THE DURRELL STORY

Gerald Durrell was a man ahead of his time. Enthralling millions with his books and films, he brought the natural world alive for a whole generation. When he founded Jersey Zoo in 1959, he began with a vision of how he could use the animal collection there to support his mission of saving species from extinction. For more than 50 years the Durrell Wildlife Conservation Trust has built on Gerald's legacy to become a leading conservation charity, saving highly threatened species in highly threatened places.

durrell

durrell wildlife conservation trust durrell.org

an international charity saving species from extinction

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PORTFOLIO: IMPRESSIONS OF INDIA

In a land of bustle and colour, the peace



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and simplicity of Nilanjan Das' images intensify the forms and textures of India's rich wildlife.

IT WAS ANOTHER heavenly late-winter morning in Assam's Kaziranga National Park; the sun was slowly rising in its typical laid-back style and a dull sky cast a soft, diffuse light. Patches of grass still swayed tall enough to conceal the country's mightiest giant: a lone elephant, wading casually through the sward.

Though the pachyderm was probably just scratching trunk against trunk, in my imagination it was saluting the tree, its protector, before disappearing into the vast thickness of the forest.

Kaziranga is one of the best-managed parks in India but it still experiences problems with poaching and the expansion of settlements at its fringes, giving rise to increasing human-elephant conflict.

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▲ **SPOTTED OWLETS ARE** common in India, easily seen in tree holes on the outskirts of cities. I found this one during a trek through the potato farms in one of the remote villages of the Chambal district in Uttar Pradesh. Fading evening light pierced the foliage to illuminate the bird's head, creating the illusion that it was floating in the hole. The owlet allowed me just a few shots before retreating into its lair.

▶ **THE LONG-AWAITED RAINS** brought relief to many inhabitants of Maharashtra's Tadoba National Park, but misery to others. The mother of this shivering newborn grey langur held it tight, trying to keep it warm, and dried its head with her hands while breast-feeding. Next day I returned to find the female still holding her baby – but the infant's head was hanging low. It had not survived the downpour.

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Stock Eagle

KAZIRANGA NATIONAL PARK in Assam – one of India's wettest states – is dominated by marshes and swamps fed by the mighty Brahmaputra River.

Kaziranga is home to a critically endangered eastern subspecies of barasingha, or swamp deer, known in Assam as *dolhorina*. In the 1970s the population of barasingha fell to an all-time low of 65 individuals in the entire country, but today, thanks to conservation efforts, numbers have risen to about 650 – still low, but better.

I was waiting near a swamp, hoping to photograph a fish eagle in action, when this small group of barasingha appeared on the horizon. They were accompanied by hundreds of bee-eaters happily feeding on the insects flushed by the deer's progress.

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◀ **THE POPULATION OF** the Asian elephant has declined drastically, due mainly to habitat loss and poaching for ivory; fewer than 50,000 survive in the wild today. The sight of a long-tusked male is slowly becoming a thing of the past, so I could not resist lying down on the path to photograph this fine tusker as he lumbered towards me in Assam's Kaziranga-Karbi Anglong elephant corridor. Once he was sure I was no threat, he slowly turned to rejoin his herd.

▲ **TAIPEI GRASS FROGS** – also known as mute frogs or thunder god frogs – are found in eastern India, Nepal, Vietnam and southern China, as well as in Taiwan. Their population has been hit hard by insecticide abuse, pollution and other human activities; they are now rarely seen. I chanced upon this frog in a marshland in Sankharipota, very close to my home in Kolkata; it was the first – and only – individual I've ever encountered.

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THE INDIAN GREY wolf, though endangered (perhaps only 2,000–3,000 survive), is the key predator of Gujarat's Velavadar National Park, a 36km^2 patch of grassland and thorn scrub. The principal attraction of the park is its healthy population of blackbuck, a handsome Indian antelope.

On this morning, I was lucky enough to come across three wolves feeding on a kill, though in the misty weather they blended so well with the habitat I nearly didn't spot them. Fortunately, the trained eyes of my forest guard picked them out, and we approached slowly on foot to avoid detection. When one of the pack sprang up and trotted towards a nearby water hole, I got a clear view for just long enough to take a few photos.

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Fiorella Gif

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▲ **THE ASSAM ROOFED** turtle is another endangered species found in Kaziranga. Individuals are often seen sunning themselves on waterside branches and logs. As well as drying their shells, basking helps them to digest nutrients. Spotting this turtle, I looked for the perfect angle to get a nice reflection, and waited for the wind to die down and the ripples to subside.

▶ **MANDVI BEACH, GUJARAT,** is known for its port and small shipmaking yards; it's also a fine spot for seeing greater flamingos, which use their oddly shaped beaks to sift the silt for food. They look like ballerinas as they stamp the muddy ground with their feet, stirring up debris in search of invertebrates. I spent nearly seven hours in the water with them – a day I will never forget.



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THE DAY HAD nearly ended in Kaziranga National Park and I was heading back towards the gate when the jeep screeched to a halt: a female Indian rhino emerged from the tall grass, leading her baby into a clearing.

Though the infant showed little interest in us, its mother was clearly nervous. My driver, anticipating a charge, had left the engine running; but instead of aggression the female opted for caution, nudging her offspring back into the protective cover of the dense grass stands.

Kaziranga is a haven for the endangered one-horned rhino; its population constitutes more than half of all those surviving in the wild. But though the park is protected by guards, the demand for rhino horn (used in traditional Asian medicines) remains high, and poaching continues to be a threat.

THE PHOTOGRAPHER: NILANJAN DAS



Kolkata-based photographer Nilanjan became interested in wildlife and evolution while studying for his PhD.

His photography explores the relationship between wildlife and the elements – storm, rain, mist and fog – using the black-and-white medium to create a minimalist form that emphasises the importance of light. His picture *Emerging blackbuck* was named the runner-up in the Nature in Black and White category of Veolia Environnement Wildlife Photographer of the Year 2010.

"My best moments in nature are perhaps spent learning the art of seeing," Nilanjan explains. "I try to use my art to tell simple stories in a language easily understood by all, creating a signature for my images that can be identified as my own way of expressing nature's beauty."



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ADVERTISEMENT FEATURE

Madagascar adventure

Explore the otherworldly landscapes and habitats of the Red Island, and meet the unique lemurs, chameleons and birds that make a journey to Madagascar unforgettable.



Madagascar is home to an abundance of wildlife – look out for the ring-tailed lemur (left) and colourful chameleons (below).

Founded in 1758, Cox & Kings is the longest established travel company in the world. We organise high-quality tailor-made, private travel and escorted small-group tours to some of the world's most fascinating destinations.

Madagascar's stunning scenery, varied forests and fascinating culture provide the ideal backdrop against which to view mammals, reptiles and a variety of bird species – amazingly, almost all vertebrates are endemic.

THE DESTINATION

Madagascar lies in the Indian Ocean, off the south-east coast of Africa. It is truly a lost world, with relics of fauna and flora dating back to the age of the dinosaurs. Every creature and plant is like nothing anywhere else on Earth, making the island a naturalist's paradise. It features almost every kind of environment, from dry desert to dense mountain forest, and is home to over 100 species of lemur as well as the famous, bulbous baobab trees. Madagascar boasts the greatest diversity of chameleons in the world, including the planet's smallest and largest.

THE OFFER

BBC Wildlife Magazine readers can save up to £250 per person when travelling on the 10-day Madagascar: Wildlife Adventure escorted group tour in 2011. Departs 8 Apr, 13 May, 10 Jun, 1 Jul, 5 Aug, 9 Sep, 7 Oct and 11 Nov 2011. 10 days from £2,325pp. The tour includes international flights, 7 nights twin-share accommodation, breakfast daily, 8 lunches, 7 dinners, all transfers and excursions.

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Found and forgotten

35,000

The number of plant species that may be gathering dust in collections awaiting scientific identification, according to Oxford University researcher Dr Robert Scotland.



Happy returns

Threatened North Island kokakos have nested in Auckland for the first time in 80 years. Two chicks hatched in the Ark in the Park open sanctuary in December. It's believed that fewer than 2,000 kokakos survive in the wild.

Geoff Moon/FLPA

NEWS OF THE EARTH

Everything you need to know about what's happening to wildlife around the world

TIGER SUMMIT: WHAT NEXT?



Despite headline commitments from tiger-range governments, campaigners believe more action is needed, reports Patrick Evans.

Russian Prime Minister Vladimir Putin, here seen tagging an Amur tiger, hosted the Global Tiger Summit in St Petersburg.

THE GLOBAL TIGER Summit in St Petersburg in November 2010 ended with promises from the 13 range states to double the number of wild tigers by 2022, but conservationists continue to call for stronger commitments to fight illegal trade and habitat fragmentation.

During the summit, NGOs, governments and individuals such as the actor Leonardo DiCaprio pledged $350 million (£225m) to be spent on stabilising existing tiger populations and on forest habitat schemes.

The funds will be administered by governments and NGOs, but overseen by a combination of the Global Tiger Forum and the Global Tiger Initiative, set up by the World Bank to connect the tiger range states.

"We need to scale up and centralise the accountability of tiger conservation," said Kristin Nowell of conservation body Cat Action Treasury. "The summit has helped, but we desperately need more messages like the one Chinese Premier Wen Jiabao put out [calling on people in China to stop consuming tiger products]... tiger farms in China are undermining the government's demand-reduction message."

WORRYING DEVELOPMENT

Meanwhile Keshav Varma, director of the Global Tiger Initiative, warned of the threat of infrastructure development in fast-growing Asian economies.

"The most disconcerting issue is that wild tiger populations are mainly sitting on the borders of countries. The day that roads reach their habitats, tigers get destroyed, so governments must think before planning new infrastructure.

"Management of parks also requires serious attention: we need GPS records of where patrols have been, and the accountability of foresters and rangers needs urgent upgrading."

The mood of the summit was encapsulated by WWF director general Jim Leape: "Initial funding commitments offered here will help get action underway. Much more funding must be mobilised in the months ahead."

TIGER TRADE

» Poaching and illegal trade have been a major factor in the dramatic 50 per cent crash in wild tiger numbers over the past decade, highlighted in a November 2010 report by the wildlife trade monitoring network Traffic.

» According to Traffic, parts representing an average of up to 118.9 tigers were seized every year in the 10 years to April 2010; the actual numbers of tigers poached were probably much higher.

» The Environmental Investigation Agency reported that in India, where it is believed the largest number of tigers is illegally killed, only 18 people were convicted of tiger poaching between 2000 and 2009 out of 882 accused.

Barcroft Media via Getty Images

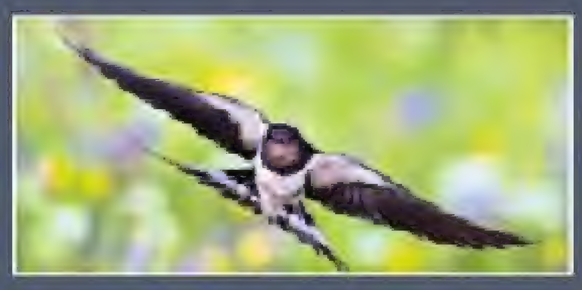
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Web of intrigue

A colony of a rare species of spider, previously feared extinct, has been rediscovered at Chippenham Fen in Cambridgeshire. The Rosser's sac spider *Clubiona rosserae* had not been seen in the UK for 10 years.



Swallows on song

The swallow was the most widespread bird in the RSPB's Volunteer & Farm Alliance 2010 survey. Some 95 per cent of the 683 farms assessed hosted the species; happily, skylarks were seen on 74 per cent of farms.

FC Rob/FLPA

'Wrong' beavers trapped

A population of unwanted beavers is to be removed from its habitat in eastern Scotland.

Beavers that have escaped from private collections and zoos and are now living wild in the Tay catchment area of eastern Scotland are being trapped and returned to captivity.

This action is being taken by Scottish Natural Heritage (SNH), after consultation with the National Species Reintroduction Forum, because the beavers' release was not licensed, and because they may not be the 'right' type. Genetic studies suggest that indigenous beavers were closely related to those in Scandinavia, whereas the animals in Tayside are thought to be from Bavaria.

SNH says that about 20 beavers now roam the area, though other estimates are higher. Spokesman Calum Macfarlane expressed hope that the Royal Zoological Society of Scotland (RZSS) will be able to find homes for those captured.

Beavers have been recorded in the Tay area for nearly a decade. The first sighting occurred near the Bridge of Earn in 2001. The animals are reportedly widespread from Aberfeldy to Forfar, down to Dundee and into Fife.

CAPTURE STRATEGY

Trapping has started in the Blairgowrie and Coupar Angus areas, which are thought to be strongholds for escaped beavers.

But opponents believe that these 'wild' beavers should be allowed to stay. Ecologist Derek Gow explains: "There have been no real reports of damage, despite beavers living cheek by jowl with people. I don't support the way the population was established, but it offers a good opportunity to trial their reintroduction." *Keith Ringland*

FURTHER INFORMATION

Read about the reintroduced beavers of Knapdale on p84.



Tayside's 'wild' beavers are targets for trappers – but some think they should stay.



Dietmar Nill/naturepl.com

A nose for bats

Twister, a six-year-old springer spaniel, has been trained to sniff out dead bats – to help environmental consultants assess the impact of windfarms on protected species. According to Wagtail UK, the company that trained Twister, dogs are better than people at finding bat carcasses; studying the remains allows scientists to develop a more accurate picture of why, and how many, bats are dying as a result of wind turbines. Research has indicated that the majority of bat deaths related to turbines are caused by a sudden drop in air pressure created by the rotating blades, but more studies are still needed. *JF*



Eye Imagery

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Unwelcome guests

£1.7bn

Annual cost to the British economy of non-native species such as the grey squirrel, according to research by Defra, the Scottish Government and the Welsh Assembly Government.



Wild words

"MANY OF US HAVE BECOME DISCONNECTED FROM THE NATURAL WORLD. CHILDREN AND ADULTS ALIKE HAVE DEVELOPED A NATURE DEFICIT."

Simon King, recently appointed president of The Wildlife Trusts, emphasises the importance of that organisation's work.

simonkingwildlife.com

Badger vaccine test succeeds

Inoculating badgers against bovine tuberculosis could reduce the extent of proposed culls.

Scientists may have made a leap forward in controlling bovine tuberculosis (bTB) in badgers.

Field trials have shown that a BCG vaccine – similar to the inoculation that humans receive – is highly successful in slowing the progress and severity of the disease in badgers, though it does not prevent infection.

"In the antibody test, the incidence [of TB] was reduced by 74 per cent," said Prof. Robbie McDonald, who is overseeing the trial for the Food and Environment Research Agency (Fera). "That's a really strong effect."

But McDonald warned that this may not translate into a decrease of bTB in livestock. "We cannot say for sure whether there would be a concomitant reduction in the disease in cattle," he explained.

Bovine TB has become a major problem over the past two decades. In 2009, more than 25,000 infected cattle had to be killed, at a cost of £63m to taxpayers in England alone.

CULL CONTROVERSY

It is known that badgers harbour bTB and could be one way that the disease is passed onto livestock. However, whether badgers are actually responsible for infecting cattle is still debated.

Defra and the Welsh Assembly conducted public consultations on plans to cull badgers in bTB 'hotspots'; both consultations closed in December 2010.

The English plan combines a cull with a badger vaccination programme around the cull area to create a 'buffer zone'.

The success of the vaccine trials could help to justify this 'belt and braces' approach. But conservation and animal-welfare organisations insist that any cull could lead to the perturbation of badger populations and thus increase the incidence of bTB.

The RSPCA's chief scientific officer, Colin Booty, points out that Fera's own analysis, published in November 2010, suggests that a vaccination-only policy would be the best course of action. *James Fair*

BACKGROUND

- Vaccinating wild animals is never easy, and badgers are no exception.
- One method is to cage-trap the badgers and inject them, which is how Fera conducted the field trial.
- This is labour-intensive, but Fera estimates that by using this method up to 90 per cent of all badgers within an area can be vaccinated.
- Fera is currently assessing the feasibility and efficacy of vaccination via an oral bait.
- This would be less labour-intensive than injection, but harder to ensure that a sufficient dose of BCG survives the badger gut acids.



A BCG vaccine may be used alongside culling of badgers to try to reduce bovine TB in cattle.

Jo Judge

IN BRIEF



Wild Wonders of Europe/NPL

TURTLE THREAT

The reduction in the number of successful nesting beaches of **loggerhead turtles** may be a result of fungal infection. Scientists studying eggs on Cape Verde found that infection with the strain *Fusarium solani* was responsible for hatching failure; this may explain, at least in part, the drop in nesting success over the past 30 years.



Ariadne Van Zandbergen/FLPA

OPTIMISM FOR APES

The population of **mountain gorillas** in the Virunga Massif has increased by over 25 per cent to 480, a 2010 census revealed. Numbers in the three national parks spanning the massif – in Uganda, the Democratic Republic of Congo and Rwanda – have risen from about 380 in 2003. The total wild population is estimated at 786.

REEF ENCOUNTER

A cold-water coral reef has been discovered off the coast of Mauritania – the first to be found at such low latitudes. The reef, measuring 50–60m in height and stretching for 190km, is more typical of the slow-growing communities in waters near Scandinavia and Ireland, and hosts gorgonians and deep-sea oysters.

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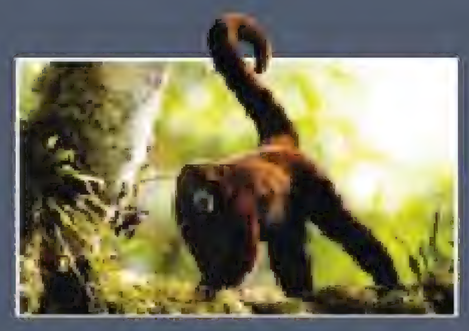
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Whale deaths

1,106

The number of pilot whales killed in the Faroe Islands in 2010. Though the total varies widely each year, this is the highest figure for a decade – 310 were killed in 2009.



Monkey magic

Populations of the Critically Endangered yellow-tailed woolly monkey have been discovered in the cloud forests of north-east Peru. These are the first to be recorded in the department of Huánuco.

Mark Bowler/ NPL

NEWS OF THE EARTH INTERNATIONAL

1-MINUTE GUIDE



Tassie tiger – or fox?

A short video clip on YouTube purports to be a thylacine – a 'Tasmanian tiger' or 'wolf' – but is it the real deal? We asked *BBC Wildlife's* mammal expert Prof. Steve Harris.

What does the footage show?
I'd say it shows a fox bounding through vegetation in typical vulpine style. It's poor quality and part of a longer sequence that is yet to be released.

So it's not a Tasmanian tiger?
Definitely not. The animal lacks the posture of the thylacine *(above)*, which had distinctively shaped hindquarters, and a semi-rigid tail carried straight out behind; the animal in the video has a low-slung curved 'brush'. Zoologist Eric Guiler interviewed many people who saw thylacines in the wild; they agreed that the animal had a shambling canter.

Are you sure?
I'm certain. It appears that the video was shot on the Australian mainland, where thylacines became extinct 2,000 years ago – finding one there today is beyond the bounds of credibility.

Might it still exist in Tasmania?
It would be fantastic if it did, but it's highly improbable. Thylacines may have hung on into the 1940s or 1950s, but firm evidence of their continued survival is conspicuously lacking. I think we have to accept that this iconic species has been lost. *JF*

What made Egypt's sharks attack?

The recent death of a tourist drew shark experts to the Red Sea resort of Sharm el-Sheikh. Stephen Moss investigates the events.

THE RECENT SPATE of shark attacks in the popular Egyptian resort of Sharm el-Sheikh has led to unwelcome attention from the world's media – unwelcome for the town, and also for sharks.

The attacks, which culminated in the death of a German swimmer, damaged the lucrative tourism industry at one of the world's most popular scuba-diving centres.

The current chain of events began in late November 2010, when two swimmers were attacked close to the shore – the first such incident here for over a year. Soon afterwards a mako shark was captured; in an echo of the film *Jaws*, local authorities announced that it was safe to go back into the water. Three days later, on 5 December, the 70-year-old German tourist was killed while snorkelling just 20m from shore.

61
The number of reported attacks by sharks on humans worldwide in 2009. Of these, five were fatal.

The two species implicated in the attacks – mako and oceanic whitetip – are normally found only in much deeper waters, where they rarely come into contact with humans.

Within a few days of the death, international shark experts arrived in Sharm el-Sheikh, aiming to answer two questions: why were these particular sharks there in the first place; and why were they targeting humans?

Scientists believe that the presence of these species in this part of the Red Sea may be explained by rising sea temperatures, which could have driven them north.

The change in behaviour that led to the attacks on swimmers may be a result of the illegal (but reportedly widespread) practice of throwing meat overboard from tourist boats to attract fish. Local conservationist Mohammed Salem said: "We think someone accustomed the sharks to being fed; whoever did it then stopped." So the sharks, their artificial food source stemmed, turned their attention to other prey in the vicinity – humans.

Food shortages caused by over-fishing may also be a factor. However, George Burgess, director of the International Shark Attack File, points to the reported dumping of sheep carcasses overboard by passing cargo ships: "That may have served as a trigger to bring larger numbers of these sharks into the northern part of the Red Sea. They may now be looking for food."

There have been calls for the sharks involved to be hunted down and killed, but Burgess doesn't think that this would help





Amr Dalsh/Reuters

Swimming at Sharm el-Sheikh beaches was temporarily banned in an attempt to avert more attacks.

naturepl.com
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Big-mouth blue

The mouth of the blue whale is so large, and can be expanded so much, that it's able to take in the equivalent of its own body mass in water in one gulp. Researchers from the USA and Canada found that the whale can consume 1,912,680kJ of krill in a mouthful containing 90 tonnes of water.



Mane attraction

168 The number of years since lions were last seen in the Great Karoo, South Africa – until the translocation of eight individuals into Karoo National Park in November 2010. Records suggest that the area's last wild lion was shot nearby in 1842.

M Schuyl/FLPA



This mako shark was identified by a diver as the fish responsible for the first attacks; a tourist was later killed by another shark.

Stringer Egypt/Reuters

to prevent future attacks: "I suppose you could go out and find that shark and spear it or catch it, but I'm not sure that's going to do much more than make us feel better."

THE HUNTER HUNTED

Ultimately, shark attacks on humans are still extremely unusual. As Ellen Husain, a marine biologist with the BBC Natural History Unit, points out: "The fact that this incident has drawn so much international attention... illustrates just how rare it is.

"We're just not on the menu for sharks most of the time. The reality is that sharks are in massive decline all over the world due to our fishing activities. You could say that we, not the sharks, are the real killers."

MAN-EATERS: THE FACTS

- Sharks very rarely attack or kill humans and do not, as is sometimes reported, become 'man-eaters'. They are opportunistic hunters, and sometimes we simply get in their way.
- On average, about four people are killed by sharks in the developed world each year, compared with more than 50 deaths from bee stings in the US alone.
- Annual deaths from lions (250), elephants (600), Australian saltwater crocodiles (2,000) and cobras (more than 50,000) greatly outnumber those from sharks.
- The most deadly animal killer of all is the mosquito (and the parasites it transmits) – malaria is responsible for more than two million deaths every year.
- You are more likely to be killed driving to the beach, by being stung by a jellyfish or even by your pet dog than you are by a shark.



MARK CARWARDINE WILD THOUGHTS

I was delighted to see that whale-watch operators from around the world were gathering in Tokyo just before Christmas. With Japan's whaling fleet already en route to Antarctica to hunt up to 935 minke whales and 50 endangered fin whales, there was nowhere better for such a get-together.

The meeting was convened by the International Fund for Animal Welfare, and the delegates – including some from Norway and Iceland, the only other two countries still whaling for commercial purposes – spent two days discussing the continued growth of the whale-watching industry. Already estimated to be worth an astonishing $2 billion a year, whale watching offers a realistic, humane and sustainable alternative to the cruelty and wastefulness of whaling.

But the growth of whale watching alone – no matter how many countries around the world are taking part – is not enough. It helps, of course, but the countries that really count are the ones that fly in the face of world opinion and continue to kill whales. We need more whale devotees in Japan, Norway and Iceland to change attitudes from within those countries.



The growth of whale watching is not enough to protect these species.

Mark Carwardine

International pressure and high-level diplomacy are crucial, but unfortunately the more a country is told what to do by 'outsiders', the less it is inclined to do it.

"Conservation groups have found that when they make vociferous protests, the level of hunting actually increases."

We've seen this in the Faroe Islands. This small territory of Denmark has faced decades of scorn and boycotts from the rest of the world, yet continues to kill hundreds of pilot whales and dolphins in the cruellest way every year. In fact, conservation groups have found that when they make vociferous protests, the level of hunting actually increases.

We would probably behave in a similar way. Just imagine if the French suddenly launched a scathing attack on Britain for killing badgers. We would certainly take umbrage. Some might even support the badger cull just to spite our meddling neighbours.

We can get upset about these atrocities, but it's vital that we also quietly assist national solutions to national problems.

Mark Carwardine is a zoologist, photographer and tv presenter.

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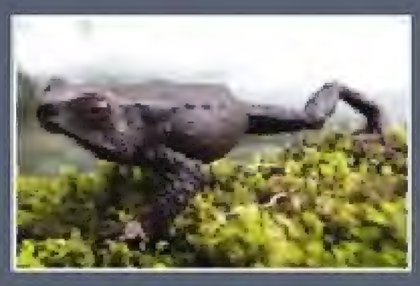
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Three little beasties.....

A trio of amphibian species has been discovered at a single site in a Colombian cloud forest. They are a toad with a beak-like snout, another with fiery red eyes (*right*) and a so-called rocket frog that carries its newly hatched tadpoles to water.

Robin Moore/ILCP



Socialites have big brains.....

Mammals tend to develop bigger brains, relative to body size, over evolutionary time – especially in social species that form stable groups. The finding draws the strongest connection yet between sociality and brain size.

NEWS OF THE EARTH

IN BRIEF

BLISTERING BARNACLES

Whales get sunburnt – and the problem is growing. Blisters and other sun-related lesions have increased in blue, sperm and fin whales, and may represent a new threat to their health. The thinning ozone layer, which absorbs fewer ultraviolet rays, may be to blame (Proc. Roy. Soc. B, doi:10.1098/rspb.2010.1903).

GET LOST!

A female agile frog *Rana dalmatina* that is mounted by an undesirable male has a trick to get him off her back. If a female is embraced by a male of another species with which she cannot produce offspring, she nevertheless lays a few eggs for him to 'fertilise'. His manhood falsely satisfied, he releases her, leaving her free to find Mr Right (Animal Behav., vol 78, pp1365–72).

MUCUS POWER

The upside-down jellyfish *Cassiopea spp.* may power reef communities in the northern Red Sea. Where it is abundant, the jelly produces up to 15 times as much organic matter, in the form of copious amounts of mucus, as certain corals. These corals were previously thought to provide most of the nutrients that create the foundation of the reef's food chain (J. Exp. Marine Biol. & Ecol., vol 384, pp99–106).



Frédéric Pacorel/Photolibrary.com



Topi antelopes use termite mounds as lookout posts to scan for danger – and as stages for showing off to potential mates.

Ingo Arndt/Minden/FLPA

Crying wolf gets the girl

Male antelopes use fear to create chances to mate with females.

The male African topi antelope *Damaliscus lunatus* has a strange way of increasing his chances with the ladies, according to a new study: he scares the wits out of them.

During the rutting season, adult male topi defend individual territories; females wander among them and mate with several suitors. Both sexes are constantly on the lookout for leopards, lions and other prowlers. Any antelope that spots danger lets loose a snort (that sounds like a person blowing his or her nose) and stares at the predator to blow its cover. Or so it would seem.

Jakob Bro-Jørgensen, from the University of Liverpool, and Wiline Pangle, from Ohio State University, observed topi antelope on a reserve in Kenya for five rut seasons. They found that a male often snorted when there was no predator in sight – but only when a receptive female was about to leave his turf. As she neared the territory boundary, he'd suddenly snort and – with erect ears and wide eyes – stare in the direction in which she was moving, as if danger lurked a few paces ahead. In response, the female typically retreated back into his territory, buying him more time to try mating with her.

Indeed, the researchers observed that males frequently made a move on the females just after they had been 'saved' by such false alarms – and were usually successful.

The tactic probably only works because a female is in oestrus for just one day so she isn't likely to catch on to the bluff. And a male has got to do all he can to get the girl when he has the chance – even if that means using a dirty trick.

LIAR, LIAR

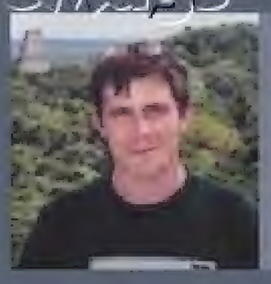
- In the presence of a female in oestrus, male topi antelope make up to nine fake snorts for every true one – but none when there are no females nearby.
- Every other day of the year, snorts are genuine – so for a female, the risk of ignoring them is too great.
- Certain bird species use false alarm calls to make their competitors flee from areas with abundant food.
- Chimpanzees produce deceptive calls to gain access to things that they want, including mates.
- Female barn swallows often cheat on their mates. If a male returns to an empty nest, he sounds an alarm that makes all of the swallows in the area scatter, thus disrupting any bad behaviour by his other half.

SOURCE: American Naturalist, vol 176, ppE33–E39 LINK: www.arkive.org/topi/damaliscus-lunatus

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DAVID BRIAN BUTVILL, ZOOLOGIST
Our *Discoveries* sleuth David writes about science and nature for magazines, radio and tv. He lives in Costa Rica, where he eagerly assists his marine-biologist wife in the field.

DISCOVERIES

Cowpat connoisseurs

Nature trumps nurture for French dung beetles.

The French scarab dung beetle *Agrilinus constans* is born with surprisingly sophisticated tastes, according to new research.

Female dung beetles lay their eggs in mammal manure, upon which the newly hatched larvae feed until they reach adulthood. Then they fly off in search of new morsels to use to start their own families. Curiously, they often seem to congregate in certain droppings. Might each beetle have a taste for – and thus seek out – its natal flavour of faeces?

A team led by Laurent Dormont, from France's National Centre for Scientific Research, reared *A. constans* larvae on the excrement of four species that are commonly used by the local wild beetle population: cattle, sheep, horse and wild boar. When the young matured into adults, the researchers offered them each kind of dung to see if they would choose their natal variety.

They didn't. Larval diet had no effect on adult preference. Rather, they all selected either cattle or sheep stool, no matter what they grew up on. It seems that French scarabs are predisposed to prefer certain types of poo. Moreover, the researchers found that their favouritism is driven purely by odour – they're innately drawn to certain mixes of *eau de toilette*.

But there is a twist. The presence of other bugs in faecal matter strongly influenced the beetles' behaviour. Samples that already contained *A. constans* individuals were more attractive than beetle-free faeces, which in turn were preferred over poo containing other species of insect. Why this is so remains a mystery.

Why they would have specialised tastes is also rather perplexing. For one, having a picky palate wouldn't seem to do much good when you depend on a scarce and patchy resource. Also, the health and hatching success of the beetles in the study didn't depend on the type of dung. But there is clearly something special about sheep and cattle poo. So though any doo-doo will do, the beetles may be hard-wired to try to give their young the best.

SOURCE: Journal of Experimental Biology, vol 213, pp3177–86

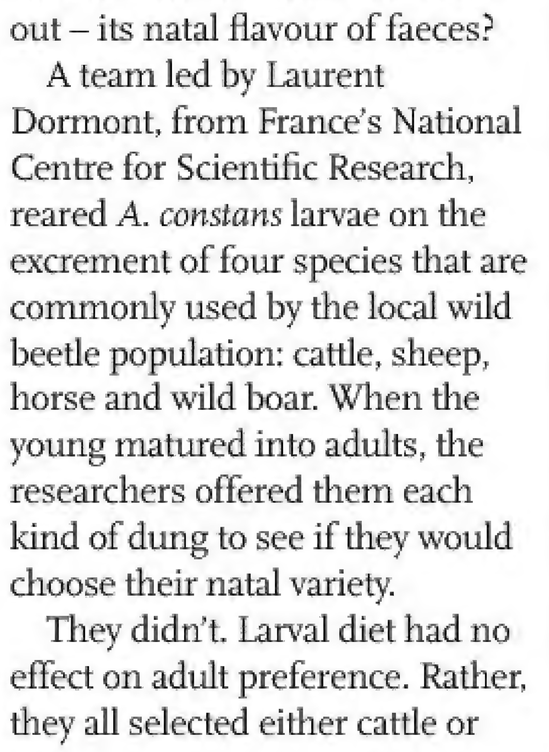


French scarabs give their eggs a good start in life by burying them in dung, preferably from sheep or cows.

Pierre Jay-Robert

DUNG DELIGHTS

- Most species of dung beetle are opportunistic. Adults generally choose the closest droppings they can find to lay their eggs in.
- The French scarab strongly prefers the dung of cattle and sheep, followed by horse and then boar.
- Cattle and sheep are both ruminants. The fermentation step of their digestive process may neutralise various chemicals in plants that repel insects.
- The beetles might prefer well-processed herbal-based waste. Boars eat some meat, while horses are herbivores but not ruminants.
- Each type of dung has a specific mix of about 30 scent compounds. Exactly what attracts the beetles remains unknown.



Two eyes are better than one for zebra finches.

Dan Hadden/ardea.com

Double vision

Zebra finches may see eye-to-eye.

The two eyes of the zebra finch *Taeniopygia guttata* – despite being on opposite sides of the bird's head – may function like one big eye, according to new research.

The eyes of many birds have separate fields of view. Each eye is controlled independently – but can birds focus on two things at once?

Joe Voss and Hans-Joachim Bischof, from Germany's Bielefeld University, used a new eye-tracking system to record the eye movements of finches in their lab. They found that, 95 per cent of the time, the birds' eyes shifted together as a unit. That is, when one rotated forward towards the beak, the other swivelled back to the same degree (like a car's front tyres). Even when the researchers presented a visual stimulus in front of the birds, they almost always looked at it with just one eye, while shifting the other back.

This eye co-ordination, which maintains the spatial relationship between the two visual fields, may provide a constant panoramic view of the bird's surroundings, albeit in a peripheral form that would appear somewhat blurry to us. In this way, the finches may be able to focus on one important detail at a time, while simultaneously keeping one eye on the big picture and remaining ever-vigilant.

SOURCE: Journal of Experimental Biology, vol 212, pp1568–75 LINK: www.eol.org/pages/1050500

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WILD Madagascar

Photos by **NICK GARBUTT**

The Red Island is home to a host of outlandish creatures that could have been dreamed up by Lewis Carroll. **NICK GARBUTT** falls under its spell.

THE EXPERT



NICK GARBUTT was an adviser on BBC2's new *Madagascar* series and has written several books about the island's wildlife.

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Eighty per cent of species on Madagascar, including this handsome panther chameleon, are endemic to the island.

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LEMUR ISLAND WILDLIFE HOTSPOTS

By DAVID ANDREW, specialist contributor to Lonely Planet's *Madagascar* guidebook

Parc National d'Ankarafantsika

Coquerel's sifakas (*above right*) sunbathe in the canopy of this dry deciduous forest; nocturnal mongooses and mouse lemurs and tree boas are easily seen on night walks. Take a boat trip on Lac Ravelobe to see endangered Madagascar fish-eagles.

Pitta-like ground-roller

Réserve Forestière de Kirindy

Several lemurs occur in Kirindy, but this dry forest is synonymous with two hard-to-see carnivores – the fosa (*right*) and narrow-striped mongoose – both of which can be reliably encountered here. October is best for fosas.

Ifaty

Hot, sandy and very dry, Ifaty has some of the last remnants of spiny forest – a bizarre mix of octopus trees, baobabs and other drought-adapted plants. Humpback whales (*above*) cruise offshore in July–September.

Leaf-litter tree frog

Réserve Spéciale de l'Ankàrana

This park is dominated by jagged limestone outcrops or *tsingy*, with pockets of deciduous forest between the eroded peaks. Look for bats in the area's many caves and up to 10 lemur species, including the crowned and northern sportive.

Masoala Peninsula & Réserve de Nosy Mangabe

The rainforest on this remote peninsula is home to the flamboyant helmet vanga and red-ruffed lemur. Nearby Nosy Mangabe island is the best place to spotlight an aye-aye (*above*).

Parc National d'Andasibe-Mantadia

Indris (*left*) are the stars of this large, hilly expanse of rainforest; its many other mammals include diademed sifakas and Goodman's mouse lemurs. The park has a long bird list, as well as Parson's chameleons and giraffe-necked weevils.

Parc National de Ranomafana

Follow Ranomafana's trail network to explore rainforested hills dissected by rushing streams. Keep your eyes peeled for minuscule leaf chameleons (*below left*), plus Milne-Edwards' sifaka and three species of bamboo lemur.

Réserve Privée de Berenty

Though not as scenic as some reserves, Berenty – an island of natural vegetation amid a sea of sisal plantations – is *the* place to see ring-tailed lemurs (*left*) and the famous 'dancing' Verreaux's sifakas.



Map illustration by Sam Symonds

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An indri executes one of its hallmark death-defying leaps. The indri is the only virtually tail-less lemur.

GLANCE AT A map of Africa and it would be easy to dismiss the omelette-shaped island off the south-east coast as nothing more than an insignificant chip off the old continental block. You might assume that its fauna and flora would be an impoverished version of the biological riches found on the mainland. Think again.

Madagascar may be 'merely' 400km from Africa at the Mozambique Channel's narrowest point, but when you're there you feel light years away. It is not just different: it is very, very different. Where else might you find a primate that thinks it's a woodpecker, a gecko that screams like a banshee and morphs into tree trunks, or a beetle with pretensions to being a giraffe? There are also chameleons the size of ants and rats the size of rabbits. Truly, Madagascar is a topsy-turvy place.

Like countless other visiting naturalists, when I first set foot on the island 20 years ago I felt as if I had followed Alice into Wonderland. Since then I have returned many times to the 'Red Island' (its soil is often a distinctive terracotta colour) and it has never failed to work its magic.

LAND OF LEMURS

Eighty per cent of Malagasy wildlife occurs nowhere else – a staggering statistic. But of the thousands of weird and wacky endemic animals found here, it is the telegenic lemurs that have become the stars. These charismatic mammals are offshoots of the primate family tree, most closely related to bushbabies and pottos. With no higher primates to compete with on Madagascar, they were able to diversify into more than 100 species, encompassing a wonderful variety of shapes, sizes and behaviour.

At one extreme are the nocturnal mouse lemurs – the world's smallest primates. A big silverback mountain gorilla can easily be 6,500 times heavier than the tiniest of them all, Madame Berthe's mouse lemur – a ridiculously cute, goggle-eyed creature

"The tiniest mouse lemur is a ridiculously cute, goggle-eyed creature that tips the scales at just 25g."



Producer's notes

LEMUR MAGIC

Mary Summerill is series producer of *Madagascar*.

Filming indris was a top priority for the crew, and we were lucky to be able to spend a month following an indri family in the Mitsinjo rainforest reserve. The group comprised a breeding pair and their two offspring – a young male and his six-month-old sister. Their territorial wailing at first light was a highly effective alarm clock for the heavy sleepers among us.

It was a challenge to keep up with these enchanting animals as they moved through the steep, tangled forest, but – at the risk of sounding anthropomorphic – as we got to know them it seemed that they would wait for us to catch up. Unfortunately, just as we had got the camera set up, they would gently move on again and wait a little further on: endearing, but frustrating! The juveniles were very playful – at one point the male spent 15 minutes throwing himself on and off a log right in front of us.



The indri: very cuddly and *very* loud.

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Verreaux's sifaka is the best-known of the eight sifaka species. These long-limbed lemurs are named for their *shi-fak* alarm calls.

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Mouse lemur: P Oxford/NPL

that tips the scales at just 25g. Collectively the most abundant members of their family, the hyperactive mouse lemurs are a highlight of night walks through wooded areas, leaping nimbly among the trees in search of berries, blossom, beetles and other titbits.

My favourite lemur, though, is the largest living species – the indri. In looks it recalls a gangly, piebald teddy bear, and it can perform prodigious leaps of up to 10m between trees. But its plangent, haunting cries are more extraordinary

Mouse lemurs fill a similar ecological niche to dormice or bushbabies. This one is a brown mouse lemur.

"The aye-aye is the epitome of zoological deviance: a jumble of quirky physical features and behaviour."

still: they have the emotional power of whalesong. In the early morning, waves of this hackle-raising sound travel far and wide through the indris' rainforest home in the humid east of the island, as each family announces ownership of its territory.

Of course, the lemur tourists most want to see is an instantly recognisable species synonymous with Madagascar itself. But though the ring-tailed lemur is today a global pin-up, it is rather atypical of its family. It lives in unusually large groups (on average 12–15 strong), spends about a quarter of its time on the ground and thrives in extremely arid habitats in the hot and dusty south.

No discussion of lemurs is complete without a mention of the animal that encapsulates all that is outrageous and wonderful about Malagasy wildlife. Hardly anyone gets to see one in the wild (I have had six sightings in two decades) and most photographs of it are taken in zoos, which only adds to its allure. Enter the aye-aye.

The aye-aye is the epitome of zoological deviance: a jumble of quirky physical features and even quirkier behaviour. Its incisors grow continuously like a rodent's, its gremlin hands have clawed digits and a skeletal middle finger, its ears are massive, mobile and leathery like those of a bat, and its mammary glands are between its hind legs. When foraging, it acts as if it

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The aye-aye is a woodpecker in mammalian form.



Dawn breaks at Berenty, whose resident star is the ring-tailed lemur.



A black and white ruffed lemur shows off the athleticism for which its family is renowned.



As their name suggests, greater bamboo lemurs are Madagascar's answer to the giant panda.

HOW TO WATCH WILD LEMURS

Many lemurs in national parks are used to humans, so close-up views are likely.

- Walk quietly, keeping noise to a minimum.
- Listen out for rustling foliage in the canopy and the lemurs' soft, grunting contact calls. Remember: they will see you long before you spot them.
- Some species, such as sifakas, ring-tails and brown lemurs, are inquisitive – if you avoid pointing or making sudden movements, they will often allow stellar viewing opportunities.
- Nocturnal lemurs can be located by eyeshine reflected in torchlight. Don't shine the beam directly into their eyes, and use a low setting or cover your torch with red cellophane.

David Andrew

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Field kit



Producer's notes



THE ROCKS THAT RING

One of Madagascar's most breathtaking landscapes is the *tsingy* of the far north. Here, tucked among the razor-sharp limestone pinnacles, pockets of lush forest shelter an array of fascinating animals. We were desperate to film the area's crowned lemurs, which traverse this seemingly hostile terrain as they move between the patches of forest in search of food. It looked impossible, but somehow the lemurs made every crossing with ease, and as they bounded from rock to rock we noticed that their thickly padded feet made the limestone finials ring.

Getting around was not so simple for us, however, especially as we had to lug a large camera mount called a jib (above) in order to produce swooping shots panning across the landscape. It was all a bit nail-biting – jibs are heavy and awkward to balance even on flat ground, and we had to be ultra-careful not to damage the fragile spindles of rock. If anyone had slipped, they would have been lacerated. But we trod very cautiously, and finally captured the sequence we had come for. *MS*

Crew: Mary Summerill



This avenue of Grandidier's baobabs has become an iconic image. Baobabs may live for over 2,000 years, their trunks reaching a girth of up to 30m.

were the progeny of a woodpecker and a squirrel (neither of which occurs on Madagascar). It survives largely on insect finger food, tapping the wood of rotting trees and listening for a hollow sound or the movement of juicy grubs.

CURIOUS CARNIVORE

At one time, before humans gatecrashed the evolutionary party 2,000 years ago, Madagascar was probably 80 per cent forest, and those forests were full of lemurs – ideal prey for a top predator. But no cats, dogs or civets reached the island after it drifted away from Africa 165 million years ago. So the coast was clear for a completely new type of hunter to emerge and fill the gap.

The evolutionary end-product was the fosa (pronounced *foo-sah*). An arboreal hunter *par excellence*, it is sleek, lithe and fantastically agile, climbing at speed – helped by 'reversible' ankles like squirrels – to chase lemurs through the canopy or (more often) ambush them at night as they sleep.

Some ants are bigger than the pygmy stump-tailed chameleon, a Lilliputian creature found on the north-east of the island.

Fosas have an eccentric mating system. Preoccupied with procreation, in October they abandon their shy, nocturnal habits, and females in oestrous climb favourite trees (they return to the same ones every year) to advertise their availability. Over a week or so a female attracts several males with scent-marking, all of which may mate with her. Faced with such stiff competition, fosas have developed some interesting sexual adaptations. They possess the largest penis relative to body size in the mammal world, and can maintain an erection for six hours.

VANISHING ACTS

One-of-a-kind mammals like the fosa or aye-aye are undeniably exciting for the naturalist, but they represent just one element of Madagascar's peculiar fauna: its endemic reptiles, amphibians, birds and insects

"No cats, dogs or civets made it to the island after it broke away from Africa. So a new type of hunter emerged."

are equally memorable. I'm especially fond of the flat- or leaf-tailed geckos, which have taken the art of deception to sublime levels.

These lizards mimic tree bark – but they don't just have the same mottled coloration. They have gone much further, developing a skirt-like frill of skin around their entire outline to help them merge imperceptibly into a tree trunk or branch. Should this fail to deter predators, the larger species suddenly open their shocking red mouths, while letting out a blood-curdling scream.

Another fascinating group of lizards with cryptic coloration are the chameleons, which probably originated here. Today, more than 80 species – half of the world's total – are restricted to the island. They range from leviathans to Lilliputians, and many sport horns and armoured 'shields' ▶

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Mega moth: the male moon or comet moth has a 20cm wingspan and 15cm long 'tails'.



Vanga beaks come in all shapes and sizes – the helmet vanga is the 'toucan' of the family.

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Madagascar's apex predator, the fosa, hunts lemurs for a living. It targets both diurnal and nocturnal species.

behind the head. The heavyweight champ, Parson's chameleon, reaches a length of 70cm – the massive, three-horned males have the swagger of mini Tricerotops.

The same cannot be said of the pygmy stump-tailed chameleon. Rarely over 20mm long, this tiny titan is among the smallest reptiles on Earth. One variety, *Brookesia peyrierasi*, is found on the idyllic island of Nosy Mangabe, off the north-east coast, where it hunts ants in the lea -litter and tries to avoid spiky, hedgehog-like tenrecs.



The giraffe-necked weevil is surely one of the wackiest insects alive.

Charles Darwin never visited Madagascar, but had he done so I can't help thinking that its fantastic biodiversity would have helped inspire his work on evolution. Take the vangas. This endemic family of birds displays a huge range of body size and beak type that, if anything, is even more pronounced than in the famous Galápagos finches.

The 15 species of vanga have evolved to occupy niches filled in other parts of the world by woodpeckers, wood-hoopoes, shrikes, tits and nuthatches. They provide an excellent example of adaptive radiation – the process by which a small stock of 'founder' individuals is isolated and then driven to diversify in spectacular fashion.

Vangas are not the only group of animals on Madagascar to show remarkably close parallels to unrelated species elsewhere. The Malagasy poison frogs (mantella) seem uncannily similar in both appearance and behaviour to the poison-dart frogs of Central and South America (Dendrobatidae) – an exquisite example of convergent evolution. In fact, the Malagasy versions are not nearly as toxic as their New World counterparts, though their bright warning coloration is every bit as striking.

KIT-BUILT INSECTS

If I had to pick one creature that sums up what makes the Red Island so special, however, it would be the giraffe-necked weevil. Try to picture a glacé cherry with a mini Anglepoise lamp attached at one end – this beetle is like nothing else on Earth. It appears to have been assembled on a whim from a kit. But why the long, magnificently articulated neck? The female uses it like a

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Hands off! A leaf-tailed gecko warns predators to leave well alone....



...and the same goes for this toxic painted mantella frog.

TOP 10 WILDLIFE HIGHLIGHTS



Reef: Frédéric Larrey

Madagascar has about 1,000km of coral reefs.

1 FOSA

One of the world's oddest carnivores. We used to think the fosa was a primitive cat, but in fact it is a strange mongoose. Very little is known about it.

2 INDRI

The largest and loudest lemur – its treetop choruses at daybreak are ear-splittingly loud.

3 GIRAFFE-NECKED WEEVIL

Often described as a beetle made by committee but perfectly engineered for the important job of rolling up leaves into nests.

4 AYE-AYE

An incredible animal in anyone's book – but also incredibly difficult to see in the wild. Nowhere common, it is – ironically – the most widespread species of lemur on Madagascar.

5 HELMET VANGA

What a beak! The huge, brilliant blue appendage of this rainforest species must rank among the most impressive in the bird world.

6 PARSON'S CHAMELEON

This monstrous lizard does a mean impression of Tricerotops. Like other chameleons, its riotous colours convey emotions and its reproductive state as well as providing camouflage.

7 FLATID LEAF BUG

In its nymph stage, this sap-sucking bug looks like shredded cotton wool. Then it transforms into a bright pink adult resembling a petal.

8 CORAL REEFS

Madagascar's reefs are home to myriad colourful fish and three species of turtle.

9 BAOBABS

Six of the world's eight species are unique to Madagascar. They are also called bottle trees after their huge, moisture-storing trunks.

10 LESSER HEDGEHOG TENREC

Totally unrelated to hedgehogs, but behaves like one. Its closest relatives include elephants, hyraxes and the aardvark.



No, it's not a hedgehog but a tenrec.

"Picture a glacé cherry with a mini Anglepoise lamp at one end – this beetle is like nothing else on Earth."

crane-cum-robotic arm to neatly roll a leaf of the species' preferred host tree into a hollow tube. She then lays a single yellow egg, barely larger than a pinhead, inside the snug nest.

And it's not just the wildlife that is special on Madagascar – entire habitats have also developed in their own idiosyncratic way. On an island where oddities are commonplace, one otherworldly landscape in particular stands out. The spiny forest of the island's south-west corner could be the set of a sci-fi movie: enormously swollen tree trunks resemble elephant's feet and many-fingered, spine-encrusted branches wave around like the tentacles of a demented octopus.

Not surprisingly, the vast majority of the spiny forest's animals and plants live nowhere else. They include three species of baobab tree that rise like obelisks from the surrounding canopy. Towards the end of the rainy season (February–March), they produce large flowers that are pollinated by various species of hawkmoth and some of the smaller nocturnal lemurs.

Amazingly, some diurnal lemurs choose to brave the ferocious daytime heat here, which often exceeds 40°C in summer: both ring-tails and Verreaux's sifakas (the celebrated 'dancers') have found a way to ▶

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Green and pleasant island? Madagascar has lost most of its native forest to slash-and-burn agriculture.

Landscape: Frédéric Larrey

eke out an existence in this inhospitable land. The latter never drink, gaining moisture only from the foliage they eat.

UP IN FLAMES

Spectacular as it is, the biodiversity we see on Madagascar is but a fraction of its former glory. The arrival of humans on the island heralded the beginning of what can only be described as an environmental holocaust.

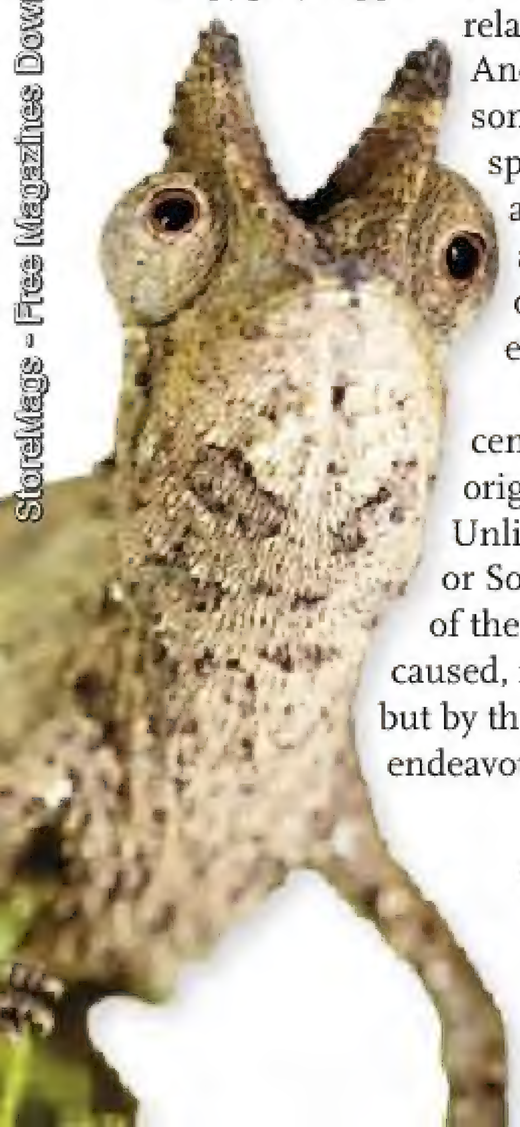
Hunting and deforestation have led to waves of extinctions. Gone are at least 17 species of giant lemur, some the size of gorillas; gone, too, is the elephant bird, *Aepyornis* (see box, *right*), three species of pygmy hippo and a strange ancient relative of the aardvark. And these are just some of the extinct species we know about. Meanwhile, a high proportion of the survivors are endangered.

Less than 8 per cent of Madagascar's original forest remains. Unlike in Latin America or South-East Asia, most of the habitat destruction is caused, not by big companies, but by the back-breaking endeavour of desperately poor people making charcoal or slashing and burning the forest by hand to grow crops (a practice known locally as *tavy*).

"Madagascar's wildlife has given us a remarkable insight into evolution, but its future hangs in the balance."

Yet there is a glaring paradox. Despite so much forest disappearing, there have been no known extinctions of lemurs in the recent past, even though many lemurs (and other endemic species) depend on native forest. And numerous discoveries offer a glimmer of hope. Scientific expeditions have located species – such as the Madagascar pochard – that had long been consigned to the history books, while other species – such as the aye-aye and greater bamboo lemur – have been found to be more common and widespread than previously thought.

Madagascar's incomparable wildlife has given us a remarkable insight into the workings of evolution, but its future hangs in the balance. One can only hope that economic development and the growth of ecotourism will help to save its natural riches for generations to come.



Rampant deforestation threatens many Malagasy species, such as this leaf chameleon.

BBC TWO **MADAGASCAR** will be broadcast on BBC2 in three parts. Check *Radio Times* for details.



Sinclair Stammers/Science Photo Library

Producer's notes



THE MYSTERIOUS ELEPHANT BIRD

The fate of the elephant bird is one of Madagascar's great natural-history riddles. A flightless giant standing 4m tall, this was the biggest bird ever to walk the Earth. It once thrived across the island, but vanished several centuries ago. No one is sure what caused it to die out, but it was probably 'death by 1,000 cuts' – a combination of egg collection by humans (though there is no proof of this), habitat loss and climate change.

We had heard that, amazingly, remains of elephant bird eggs (*above*) could still be found on a remote beach at Cap Sainte Marie, the island's windswept southernmost point – and this was something we had to film. We expected to see just a few scattered fragments, but came across great circles of broken, creamy-white eggshells, each obviously the remains of a huge nest several metres wide. They may have lain on that beach for 1,000 years – the last echo of an astonishing animal. *MS*

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Day 9 Bandhavgarh National Park, 4-nights, Kings Lodge. Explore on safari (BLD)
Day 13 Overnight train to Agra, after a final morning in Bandhavgarh (BLD)
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Return of the SPANISH TIGER

The future of the world's rarest cat is looking brighter at last. PETE OXFORD and RENEÉ BISH discover that to save the Iberian lynx, you first need to help the humble European rabbit.

Now you see me... the Iberian lynx is expert at slipping through its scrubby habitat unseen. The smallest of the world's three lynx species, it has a liberally spotted tawny coat.

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THE EXPERTS



PETE OXFORD is a biologist and wildlife photographer based in Ecuador. He took these photos over three months in 2009.



RENEÉ BISH travels the world with her husband Pete in search of stories about the natural world and native cultures.

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Fiorella66



Young hand-reared lynx are taught how to hunt by releasing live prey (in this case a quail) into their pens.

IBERIAN LYNX IN NUMBERS

The highs and lows of the rarest cat in the world.

1 Of the 36 species of wild cat around the world, the Iberian lynx is the only one listed as Critically Endangered by the IUCN.

1973 The year in which the last Spanish lynx-hunting licence was issued. Today, the species is strictly protected.

90 The percentage of the Iberian lynx's diet made up of rabbits.

3 The number of rabbits needed per day by a lactating Iberian lynx.

10,000 If the Iberian lynx goes extinct, it will be the first feline to die out since the sabre-toothed tiger in about 10,000 BCE. It was relatively common on the Iberian Peninsula even until the 1960s.

100 The estimated size of the Iberian lynx population at its lowest point in 2001–3.

265 The estimated maximum size of the wild Iberian lynx population today.



Going to the wall: this hunting trophy is a sad end for a magnificent feline.

IT IS IRONIC that the rarest cat of all – the Iberian lynx – depends upon an animal many of us consider too common, its populations rocketing to plague proportions in some parts of the world.

The creature in question? The unassuming European rabbit. But where this species shares its range with the surviving lynx populations, it is suffering a drastic decline. Herein lies the problem for lynx conservationists.

LAND OF RABBITS

An early name for the Iberian Peninsula, *Ispania*, means 'Land of rabbits'. For it was here, in the unique Mediterranean landscape of cork oak woods and sweet-scented scrub, that this famously fast-breeding vegetarian species originated. It evolved together with the Iberian lynx, the latter becoming a specialist predator adapted to an almost exclusive rabbit diet. So it's no surprise that the cat came to be seen as a competitor by people who enjoyed hunting rabbits and, as a result, it was poisoned, trapped and shot.

At the same time, the combined effects of hunting and disease (myxomatosis and the rabbit haemorrhagic virus) caused rabbit numbers to crash in Spain. With its prey vanishing fast, and with licences to hunt lynx freely available (see box, *above*), the population also began to plummet, hitting an all-time low of just 100 individuals.

In 2001 a bold conservation project was launched in a last-ditch attempt to rescue the Iberian lynx from what looked like a near-certain demise. Called Life Lince, after the Spanish for lynx, it was headed by Miguel Ángel Simón, already renowned for the successful reintroduction of lammergeiers (bearded vultures) in Andalucía.

The project adopted two main approaches. Its *ex situ* captive-rearing programme was developed by Astrid Vargas, who was part of the team that restored the black-footed ferret to the prairies of the USA. Lynx are actually quite easy to breed in captivity, and when news of the first one to be born in captivity was released in 2005, it was hailed as a major triumph by politicians and the media. Cue over-optimistic headlines declaring "The lynx is saved!" The Life Lince team cringed. While the birth was a step in the right direction, the Iberian lynx was still firmly on the critical list.

Astrid is the first to admit that, though captive-breeding creates a valuable reservoir of genetic diversity, it is but a small part of the overall conservation strategy. "Until our captive-bred lynx have reproduced in the wild – and until the cats are fully restored to their former range – there is no hope for the species," she says. In the meantime, at least the cats in her care are doing what comes naturally: by 2009, the breeding programme was looking after 78 lynx – 42 of which had taken their first steps in captivity.

DID YOU KNOW?

The name 'lynx' is derived from the Middle English word for 'brightness', and is often said to refer to the way the cat's eyes appear to glow when it is glimpsed hunting at night.

FINAL REFUGES

The Life Lince project also works in the field. It aims to restore lynx habitat, reintroduce the species to its former haunts and help rabbit numbers to recover, while spreading the word among people in the last two strongholds of wild lynx (Doñana National Park and the Sierra Morena mountains) about the great rarity living on their doorstep.

The support of landowners is vital, because neither of these locations is truly a safe haven. In the Doñana, large pine plantations are a major barrier to lynx expansion: they cannot support rabbits – or lynx. A new road and the growth of polytunnel agriculture have piled further pressure on the national park's cats. ▶

Vehicles and lynx don't mix, so distinctive road signs alert drivers to the cats' presence.

Photos by Pete Oxford; road sign: Pete Oxford/Minden/FLPA

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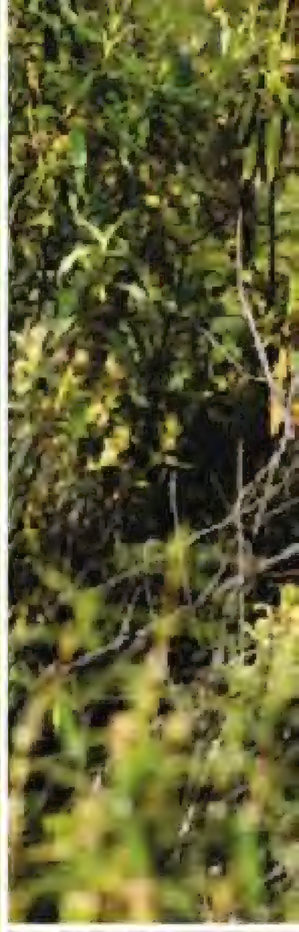
Those tufted ears can mean only one thing: a lynx is on the prowl. The cat is most active on dark nights.

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The perfect home for an Iberian lynx is a mosaic of dry woodland, scrub and open grassland.



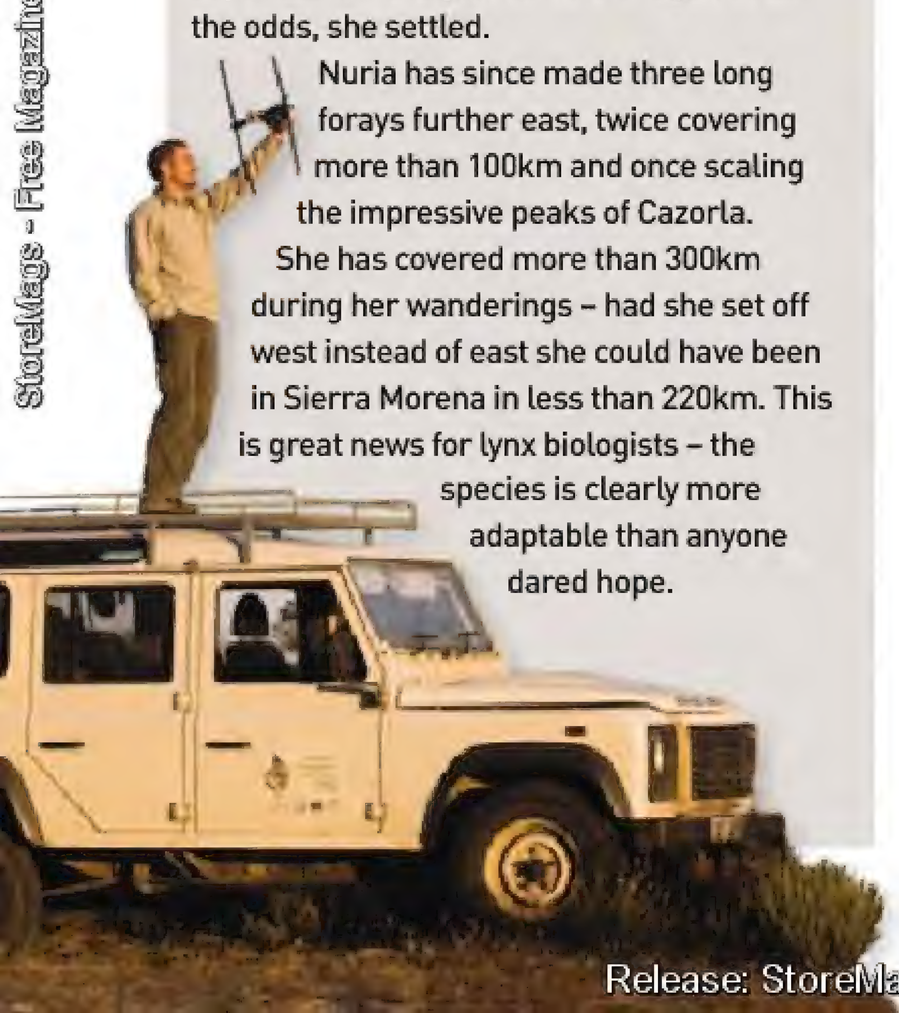


TRACKING LYNX

Until recently, studies of Iberian lynx in the Doñana region tended to support the view that the cat does not travel very far from its birthplace. Researchers concluded that little interbreeding takes place between separate populations. But on 3 March 2009 an old, radio-collared female called Nuria embarked on a journey that blew this theory apart.

Expelled from her territory by her daughter (a common fate for an elderly lynx), Nuria headed east. She was soon confronted by stark expanses of olive groves, where, against all the odds, she settled.

Nuria has since made three long forays further east, twice covering more than 100km and once scaling the impressive peaks of Cazorla. She has covered more than 300km during her wanderings – had she set off west instead of east she could have been in Sierra Morena in less than 220km. This is great news for lynx biologists – the species is clearly more adaptable than anyone dared hope.



Photos by Pete Oxford; lynx lx2l: Pete Oxford/Minden/FLPA

To the north-east, far too many lynx are also meeting a sad end on the twisting roads of the Sierra Morena, but here things are starting to look somewhat better for the beleaguered felines. In fact, in some places with a thriving – and therefore dense – lynx population, it is not unheard of for them to die of wounds inflicted during territorial disputes.

In 2003, there were just a single adult male and female in the core area of Valquemado in Sierra de Andújar. Today, there are more than 30 individuals, six of them territory-holding females. In nearby Yeguas, researchers counted an impressive 60 lynx.

These 'saturated' areas will provide a ready supply of lynx for reintroductions elsewhere, and potential release sites are being prepared for the cats by encouraging the local rabbits to breed. This is achieved by the novel technique of building enclosures from chain-link fencing that is high enough to keep out foxes, badgers, mongooses and boars, but over which lynx can leap comfortably. The final piece in the jigsaw? Making the rabbits feel at home. Artificial warrens or 'rabbitats' are installed to ensure that they flourish.

At 1–7ha, the enclosures are ample for a lynx in need of a territory, which is all-important. "We should not be talking simply about lynx numbers," Miguel tells me. "Territorial females are the future of the species. But before they can breed, they – like the rabbits – need a home to call their own."

Tracking radio-tagged lynx provides crucial data for the Life Lince conservation effort.

WINNING HEARTS AND MINDS

Some parts of the species' historic range have good rabbit populations, but no lynx. These locations are ripe for reintroductions, but it is too risky to release precious lynx here until local landowners embrace the project.

Encouragingly, farmers are being won over by the idea that having lynx on their land will keep foxes, mongooses, feral cats and other 'pests' at bay. The lynx keep their large territories free of rival rabbit predators, enabling their favoured prey to thrive.

"Territorial females are the future of the species. But before they breed, they need a home to call their own."

So far 150 landowners and hunters have pledged to protect lynx (over 180,000ha have been safeguarded in this way). They undertake to look after natural habitats, prevent the use of snares on their property and allow Life Lince to set up rabbitats, supplementary feeding areas and camera-traps.

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High fences are designed to keep foxes off farmers' land but let in the more agile lynx.



Artificial warrens boost rabbit numbers, ensuring there is plenty of lynx food.



These gruesome leg-hold traps were once used to snare lynx.

In return, the Life Lince team sows crops that rabbits and other game prefer, and prunes the cork oak trees to improve the acorn crop – a favourite food of deer and wild boar, both popular quarry for hunters.

RETURN TO THE WILD

In 2009, Miguel and his group were finally ready to begin translocating wild lynx to new areas – a moment the conservationists had long been praying for. So far, they have taken six wild individuals from the Sierra Morena to the chosen release zone, the Guadalmellato region in Córdoba.

The three breeding pairs were released into their own 4ha enclosure, and all of the cats were fitted with radio-collars to track their movements (see box, *left*). When the females fell pregnant, the males – which do not help to raise the young – were set free to allow them to explore the wider area.

Only one of the females successfully raised kittens (twins), and one of the adult males died. But the rest of the cats adapted well to their new home, gradually increasing the embryonic population to nine. So far, so good – the team's plan was working.

Across the border in Portugal, lynx are presumed extinct, but in June 2009 its government signed an agreement with Spain to provide lynx for a captive-breeding programme in the country. These cats will one day be used to repopulate its mountains.

During the three months I spent watching lynx in the wild, I saw 15 individuals. The bad news is that these cats constitute 7 per cent of the world's total. The good news is that the wild population has doubled since its lowest point a decade ago, and the lynx roam an area twice as large as they did then.

On my last day in the field, a Life Lince researcher showed me a series of blurry camera-trap pictures. They were the first confirmation that a female known as Rapas had again raised a family. Surprisingly, she was accompanied by Paz – the father of the litter. Moreover, Elanio (Rapas' son born in 2008) was with them, too.

I saw Elanio many times. He was invariably carrying a rabbit over the hill in the direction from which Rapas often appeared – as was Diana, his older sister. Perhaps they were helping their mother to feed her new litter? The photos seemed to confirm this as yet unproven theory. How extraordinary this would be for a species long thought to be solitary.

There is clearly much still to learn about the Iberian lynx. Here's hoping that this wonderful animal will surprise us yet again With a little help, it may prove more resilient than we might once have imagined.

FIND OUT MORE

Join James Fair on his quest to see a wild Iberian lynx at www.discoverwildlife.com/travel/iberian-lynx

Illustration by Priscilla Barrett, from *Collins Field Guide: Mammals of Britain and Europe*

BBC Wildlife FACTSHEET

IBERIAN LYNX

Lynx pardinus

THE BASICS



- LENGTH Head–body 65–100cm; tail 11–13cm.
- SHOULDER HEIGHT 40–50cm.
- WEIGHT Male average 13.6kg; female average 10kg.
- APPEARANCE Compact cat with erect ear tufts, a long white beard (longer with age and in males) and a short, bobbed tail. Sierra de Andújar lynx are reddish-grey with tabby-like stripes and spots; Doñana individuals have bolder spots and lack stripes.
- DIET Almost exclusively rabbits. Adults require one rabbit per day. Very occasionally takes partridges, young deer or mouflon (wild sheep).
- LIFE CYCLE Females with a territory can breed at two years old. They give birth to two to four kittens in a rock crevice or hollow tree, after a gestation of about 60 days. Kittens stay with their mother for 20 months.
- HABITAT Mediterranean scrub and cork oak forest.
- LIFESPAN Up to 13 years in the wild.
- STATUS Critically Endangered; total wild population is estimated to be 265 (2010 census).

DISTRIBUTION



GET INVOLVED

For more information about the fight to save the Iberian lynx and how you can help, visit www.lifelince.org or www.fauna-flora.org/species/iberian-lynx

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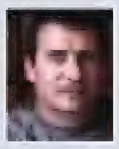
Illustration by Jonathan Gibbs/Central Illustration Agency

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RAISE

Birdsong in all its many forms is surely one of the greatest pleasures, says MARK COCKER.

THE EXPERT



MARK COCKER is an author with a special interest in birds' cultural importance. His favourite birdsong? That of the European blackbird.

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The sound of a song thrush is to be cherished, especially when numbers are falling dramatically.

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TOWARDS THE END of Cormac McCarthy's brutally dark novel about worldwide environmental catastrophe, *The Road*, there is a pivotal moment when its two central characters are forced to spend their nights in a black, freezing wasteland. To escape this nightmarish place, one of them is described as falling into dreams that are "softly colored worlds of human love, the songs of birds, the sun".

There we have it: human life stripped back to its fundamental sources of happiness. There is no life without the sun, and not much of a life without human fellowship, but why exactly should we celebrate birdsong? What is it about those avian sounds that can somehow stand for all the blessings of nature and has affected us throughout the ages and across continents?

For McCarthy himself, birdsong is surely a metaphor for the whole glorious life support system represented by a healthy environment – the network that nourishes both human body and soul. This harmony is the very thing obliterated in *The Road*. Yet others have felt equally strongly about its impact. Ancient Sanskrit writings from India declared that a place without birds was a meal without spice. It is a sentiment that is also deeply rooted in our own culture. The author Aldous Huxley once suggested that if we took birds out of British poetry we would have to dispense with half of the English canon.

DID YOU KNOW?

Some bird calls are pitched beyond the range of the human ear. One of the first to be lost in our middle age is the goldcrest's silvery, needle-fine squeaking.

COMPLEX COMPOSITIONS

Perhaps we should be clear about what birdsong is. Birds make all sorts of noises for a host of reasons: contact calls to keep in touch with one another, threat sounds to warn off rivals and mutual alerts about common danger. Yet song is usually produced by the male during the breeding season, and it is invariably more complex in structure and length than a mere call.

The skylark is a perfect example. The sound it uses in most non-breeding circumstances is a dry monosyllable often transcribed as 'prrrut'. Its song, on the other hand, is a glorious elaboration of that same rudimentary unit. The male broadcasts from on high, in a special aerial song flight, a seemingly endless jangle of joyous notes that rolls and undulates, rather like the contours of the open landscapes that skylarks frequently inhabit.

It is precisely this vocal performance of birds, the song display during the breeding season, that we have judged and celebrated for its closeness to human music.

Yet the skylark's functional calls and its beautiful song are actually not that different. For the latter, too, has a practical purpose. The song serves its author as an audible 'No entry' sign posted around his territory for all

"Ancient Sanskrit writings from India declared that a place without birds was a meal without spice."

Laurie Campbell/rspb-images.com

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of his male neighbours to heed, while also advertising to any female that the same cock bird is available as a potential mate.

CULTURAL MEANINGS

Very little of this natural history has a bearing on our cultural celebration of birdsong, however. Who listens to a blackbird or song thrush on a summer's evening and then dwells on the idea that its song is a form of sexual warfare conducted through music? Far from it. We are invariably moved by its uplifting joyous quality or its sheer spring-like gusto.

In other words, we are interested in what the song means to us, rather than how it functions for the bird. We frequently load birdsongs with all sorts of cultural meanings that have very little to do with the avian world at all.

The exemplar is probably the species most celebrated for its song in Europe: the nightingale. One idea that held sway over our collective imaginations for 1,000 years was that it was the female that did the singing. Even John Clare, the most observant and rigorous (in a natural-history sense) of 19th-century poets to celebrate this bird, closed his sonnet with the line: "Still sings the Nightingale her sweet melodious song." Confusing the songster's sex was actually the least of our distortion.

It was widely assumed that when the hen nightingale poured forth she was accustomed to lean her breast on a thorn, so that as she sang she was able to impart more emphatically the metaphysical pain inflicted by love. For it was inferred that nightingale song was essentially a music of lost love and of sadness. Even now, people conventionally talk of the forceful rhythmic pulse in the performance as 'sobbing'.

I defy anyone to track down and listen to a real nightingale and not find their imaginations conjuring up romantic images created by poets and other writers. In a sense we don't hear the bird itself – rather, we encounter the briar of ideas with which we have surrounded it.

"Who listens to a blackbird and then dwells on the idea that its song is a form of sexual warfare conducted through music? Far from it."

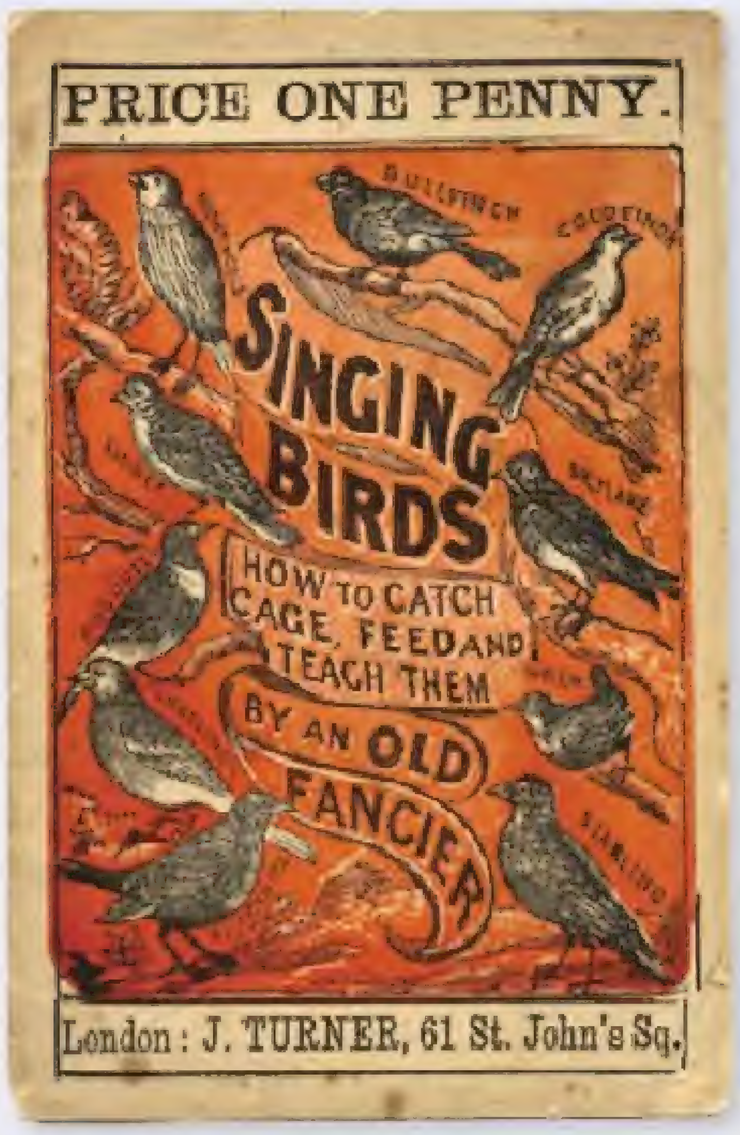
Was a reaction to this literary hijacking of nature behind the recent verdict on our favourite songbird? In a poll of the UK's top 10 songsters, a much simpler and – dare I say it – more emotionally 'honest' performer came out top: the song thrush. There is something true and clear about its ringing bell-like notes that helps to explain why we should love the species. Yet perhaps there was another factor at work. Unlike the nightingale, which is scarce and occurs ▶

GOOD VIBRATIONS

Birdsong is created by an organ found in no other animal.

People have kept cage birds for at least 3,000 years, coming up with ingenious theories about their vocal outpourings. For example, it was once common practice to split the tongues of starlings and crows in the mistaken belief that it would help them to talk.

In fact, the tongue plays no part in bird vocalisation (except among parrots). The true organ of sound is the syrinx. Located near where the trachea (windpipe) divides, it is an arrangement of cartilage, muscle and vibratory membranes over which exhaled and inhaled air passes, and can generate sounds of extraordinary complexity. Some birds are even able to produce two notes simultaneously.



An 1885 guide to keeping songbirds, published before the syrinx was fully understood.

Amanet Tanner/Alamy

CHART-TOPPING SONGSTERS

In an avian spin on *The X Factor*, these species would be in the final.



David Tipling/rspb-images.com

The glorious rolling song of a SKYLARK is more celebrated by British poets than almost any other sound.



Laurie Campbell/rspb-images.com

The soft green-leaved freshness of the song of the BLACKBIRD is one of the highlights of the British spring.



Dave Bevan

The ROBIN is one of the few species of British garden bird in which both males and females sing.



Rex Features

The STARLING is famous for imitating anything from a dog's bark through to the ringtone of a telephone.

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Albert's lyrebird is one of the world's most gifted (and largest) songbirds.

Michael Snedic

HOW TO LEARN BIRDSONG

Familiarise yourself with common species first, advises Mark Cocker.

New technology means that learning birdsong has never been easier: there is a wealth of websites, MP3 downloads, CDs and DVDs to help you tell one sound from another. But these are only aids. There is no substitute for listening to real birds.

The best time to begin is late winter as fewer species are singing. Try to master the sounds of your local 'anchor' species – simple songs such as (in Europe) the double chime of the great tit, the sneezing notes of the greenfinch or the repeated, crystal-clear phrases of the song thrush. Then get to grips with more complex songs such as those of the robin or wren, and gradually increase your repertoire.

The best beginners' guide is Collins' *Garden Bird Songs and Calls* by Geoff Sample (booklet and CD, £14.99).



only in southern England in summer, song thrushes are abundant and widespread. From the Hebrides to Hampstead Heath, people everywhere can enjoy listening to their powerful performances.

SONG AS MEMORY

While all of us respond to birdsong differently, a common feature in our celebration of the phenomenon is that it becomes a personal memory bank for all of the other occasions we listened to that same sound. So a favourite song is almost, by definition, a continuing narrative about ourselves.

What we cherish are the other times we are reminded of, as much as the moment it speaks to now. The voice that triggers such a cascade of thoughts and feelings can actually be remarkably plain – for example, the doggedly repetitive disyllable of the common cuckoo, or the hoarse oboe notes of the woodpigeon.

The philosopher Immanuel Kant asked if it mattered to our enjoyment of birdsong that we know its author's name. He concluded that it did, but perhaps a more intriguing modern question is: does it matter if we understand the natural history contained in a song? This is especially relevant to a suite of mimics, such as the European starling, the sedge warbler and Australia's largest songbirds, the superb and Albert's lyrebirds.

All of these birds famously incorporate into their performances a huge range of sounds that they pick up from other sources. The starling that does a perfect imitation of a curlew or tawny owl while sitting on a chimney pot is perhaps Britain's best-known avian cover artist. Being able to recognise the mimicry being performed surely enriches our appreciation.

THE ART OF MIMICRY

I sometimes feel that knowledge of a song's wider context is pivotal. The lyrebirds, among the world's grandest songsters, borrow all sorts of artificial noises, from the whining buzz of chain saws to the motor drive on a camera, revving car engines, mellifluous flute music and spoken words.

In Lamington National Park in southern Queensland the Albert's lyrebirds have been known to integrate a segment

"Lyrebirds borrow all sorts of noises, from the whining buzz of chain saws to the motor drive on a camera."

of highly syncopated rhythmic clapping sounds into their songs, even bouncing on vine stems as they deliver it. The whole fandango is thought to have been borrowed from music the birds once heard enacted at the ritual corroborees (ceremonial meetings) of local Aborigines.

What makes this mimicry so intriguing is that the area's Aborigines died out more than a century ago. If what we hear when a male Albert's lyrebird reproduces these rhythmic passages is actually an echo of human chanting from 100 years earlier, copied and passed on down generations of lyrebirds, then it is one of just a handful of instances where birdsong is a repository for human culture.

We are accustomed to examples of our own art – cave paintings or Egyptian murals, for instance – that record the lives of lost birds. Here, however, the roles are reversed. It is the extraordinary sound organ, or syrinx, of a songbird that has managed to keep alive the memory of the species' vanished human neighbours.

GOING FOR A SONG

» Listen to all of the songs in this article at www.discoverwildlife.com/birdsong

» To hear the favourite British birdsongs of wildlife sound recordist Chris Watson, visit www.guardian.co.uk/environment/series/top-10-uk-bird-songs

» One of the best online birdsong libraries is www.xeno-canto.org

» With photographer David Tipling, Mark is working on a book about birds' cultural importance, *Birds and People*, and would love to know your favourite birdsong. Visit www.birdsandpeople.org or email markcocker@randomhouse.co.uk (all contributions used will be acknowledged).

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Image courtesy of Wendy Ball

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This deceptively simple yet imaginative and well-executed photo won Bence Máté the title Veolia Environnement Wildlife Photographer of the Year 2010.

VEOLIA ENVIRONNEMENT

WILDLIFE PHOTOGRAPHER OF THE YEAR 2011

WIN £10,000
BE QUICK – ENTER BY 18 MARCH 2011



Welcome to the Veolia Environnement Wildlife Photographer of the Year competition 2011. I hope that you will enter and that a few tips will help you to select some winning images.

BY THE CHAIRMAN OF THE JUDGES MARK CARWARDINE

IT'S HARD TO believe, but this will be the 47th year of the competition, and it promises to be bigger, and even more inspiring, than ever before.

Already, it has become *the* international measure for great wildlife photography – the competition that all nature photographers, amateur and professional, young and not so young, dream of winning. And yet, somehow, the standard of entries continues to improve year after year.

Nothing speaks louder than an evocative photograph that stirs the imagination, pulls at the heart strings and engages the mind. So perhaps it's not surprising that the winning selection gives enormous pleasure to millions of people through books, magazines, newspapers and a major exhibition that opens at the Natural History Museum in London, and then tours the UK and the world.

As the greatest showcase of its kind, the competition plays a crucial role in raising the profile of wildlife photography. It has certainly encouraged more people to get out and about than ever before, taking pictures of wildlife and enjoying the great outdoors.

And it is leading the way in encouraging *responsible* wildlife photography. We are looking for images of genuinely – and exclusively – wild animals, plants and landscapes that have not been heavily manipulated on a computer. With this in mind, we encourage photographers who care about their subjects and are determined to represent them as faithfully as possible.

Best of all, one of the most rewarding aspects of the competition is the number of youngsters proving themselves to be every bit as capable as their older peers.

And it is exciting and encouraging to see the growing number of truly outstanding up-and-coming amateur photographers who'll be keeping the well-established pros on their toes in years to come. This really is a competition for everyone.

I do hope you'll be entering this year – and wish you the very best of luck!

Bence Máté/Veolia Environnement WPOY 2010

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How to select a portfolio

It can be hard to pick images that will most impress the judges, so Mark Carwardine explains how to select a truly eye-catching portfolio.

ANYONE WHO HAS entered the Wildlife Photographer of the Year competition in the past will know that choosing which pictures to submit is easier said than done. It's almost as important, and in some ways almost as difficult, as taking the pictures in the first place. Selecting single images is hard enough, but putting together portfolios can keep you awake at night. Yet two of the most popular categories in the competition are for portfolios: Wildlife Photojournalist of the Year and the Eric Hosking Award.

There is no magic formula for creating a prize-winning set of pictures, but there are a few hints and tips that will help.

ONE: SCRUTINISE EACH PICTURE

First of all, make a shortlist – ideally, two or three times as many images as you are allowed to enter in the portfolio. Then scrutinise each shot individually. Each one has to be sufficiently strong to stand on its own.

Be hard on yourself. Is every image pin-sharp or is one slightly soft? Is the light subtle and beautiful or harsh and contrasty? Have you captured a perfect moment or have you just missed it? Is the background clean and simple or is it spoiled by unwanted distractions? Is there an interesting symmetry to the picture or does it feel uncomfortable?

Be a tough editor. Be critical of your work and only include your very best.

TWO: MAINTAIN THE STANDARD

Unfortunately, it's not good enough for *most* of the images to be outstanding – *all* of them have to be outstanding. Bear in mind that each picture in the portfolio will be reproduced at the same size as all the other winning pictures in the exhibition. So weak images won't hide behind the better ones – they'll be noticed immediately and will detract from the overall impact of the portfolio.

I've forgotten the number of times portfolios entered in the competition have been dropped by the judges simply because of one or two weak images that let the side down.

A PERFECT PORTFOLIO BY STEFANO UNTERTHINER



1 INTRODUCE YOUR SUBJECT: THE CAPE GROUND SQUIRREL
This portfolio has two objectives: to show that the photographer has covered a single subject in intimate detail and to demonstrate a wide range of photographic techniques and styles.



2 KEEP UP THE QUALITY: A PERFECT STORM
Every image is outstanding in its own right. There is no weak shot in the portfolio and nothing to detract from the overall impact of the six pictures together.



3 DEMONSTRATE RANGE: HERE COMES THE GROOMING
The photographer has worked hard to show the ground squirrels in a variety of different situations. This calm grooming scene contrasts beautifully with the dramatic sandstorm in the previous shot.

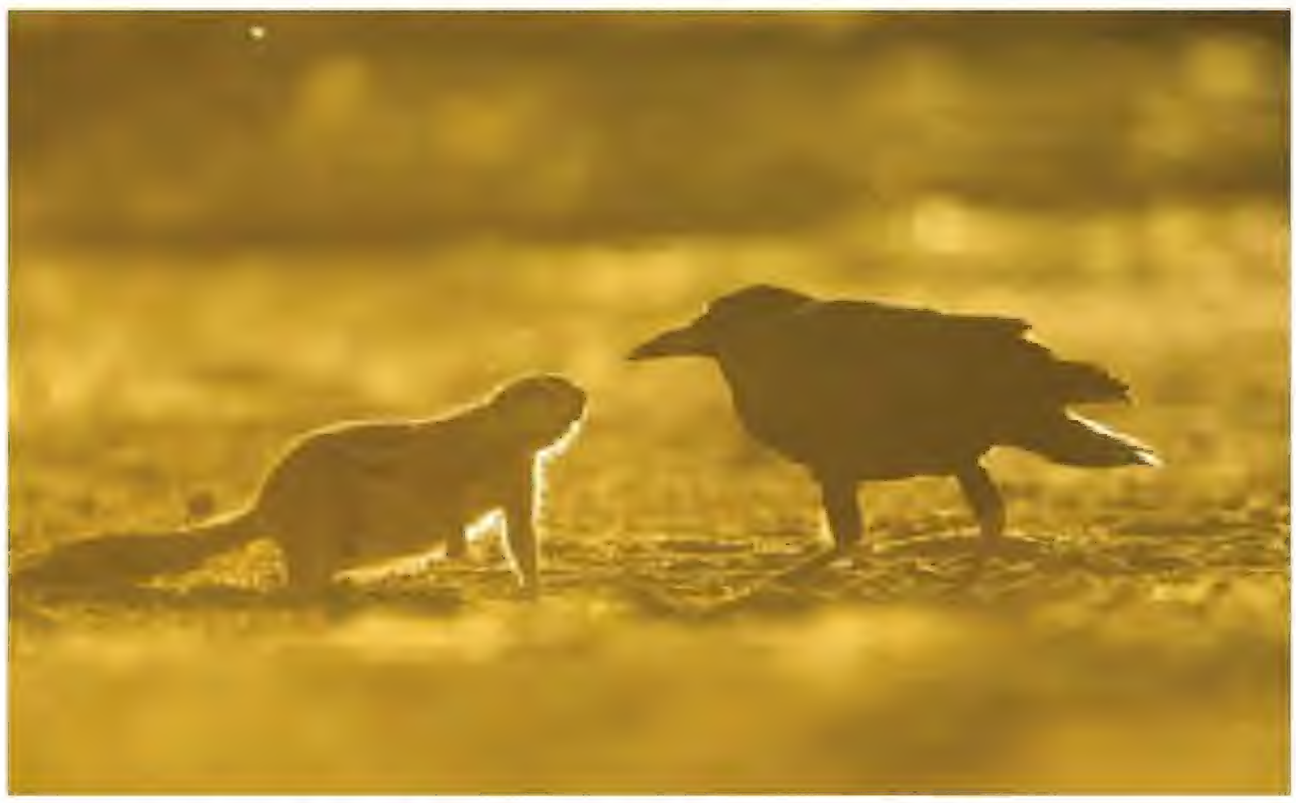
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4 BECOME AN EXPERT: GETTING TO GNAW YOU
You get the impression that the photographer has spent a lot of time working with these animals. There is even a picture from inside an underground burrow.



5 USE CHANGES OF PACE: DANCING CHEEK TO BEAK
At one extreme, there is a stunning action shot of an encounter with a Cape crow and, at the other, a wide-angle portrait of a squirrel feeding in a field of seed heads in the Kalahari (see image 1).



6 SHOW YOUR ART: SHADOW BOXING
The icing on the cake is the artistic variety – from more traditional behaviour and environment shots to a much more artistic image where the shadow is more important than the squirrel itself.

THREE: ASSESS YOUR IMAGES TOGETHER
Once you are confident that all of the pictures in the running are potential prizewinners, think about how they work together. Try different combinations of images to see how they complement one another. While you're doing it, think about what you are trying to achieve with the portfolio. Are you attempting to show the judges that you have covered a single subject in intimate detail? Or are you trying to demonstrate a wide range of photographic techniques and styles? You'd be surprised how many portfolios fall between these two stools and therefore fail to demonstrate anything in particular.

FOUR: PHOTOJOURNALIST OF THE YEAR
With this in mind, let's consider the competition's two portfolios in more detail. Wildlife Photojournalist of the Year is for a sequence of six pictures that tell a memorable story. Picture quality is crucial, of course, but it's also essential that the story itself is powerful and works without further explanation. It's all about proving that a picture really is worth 1,000 words.

What makes this category so inspiring (and challenging) is that you have a free rein. You can choose virtually any subject or style – plants or animals, behaviour or environmental issues, colour or black and white, traditional or creative. So think about the story you are trying to tell, or what emotion you are trying to stir, and piece the portfolio together as you would a jigsaw.

Without any prompting, ask your friends to tell you what they think you are trying to say – and then adapt accordingly. Remember that there's nothing more frustrating, as a judge, than studying a portfolio of six wonderful images if the story isn't immediately apparent.

FIVE: ERIC HOSKING AWARD
The Eric Hosking Award is quite different, because there is no need to tell a story. This category, aimed at young photographers aged 18–26, is for a portfolio of 10 images that represents your very best work.

With this in mind, a variety of subjects and styles demonstrating your talents and creativity is what the judges are looking for. Ten pictures of an endangered aye-aye taken with flash on a single night – no matter how good they are – are less likely to win than the same number of pictures of common or garden birds taken using a variety of techniques and creative styles and, for example, under different weather conditions.

The golden rule is to allow enough time to prepare. Don't panic the night before the deadline and spend the early hours hastily throwing your images together in arbitrary little collections. I guarantee that the judges will be able to tell.

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Fiorella Egf

How to be a winner

There are no hard and fast rules to explain why one photo wins a competition and another doesn't, but there *are* ways of improving the odds. Assuming you're more than capable of taking prizewinning pictures, and processing them without over-sharpening, over-saturating or over-cropping, here are a few tips for picking the most likely winners.

» BE ORIGINAL This is crucial. Imagine you are a judge looking at thousands upon thousands of photographs. Many of them are technically flawless – well exposed, perfectly sharp and pleasantly composed – and, after a while, you take these key ingredients for granted. You become desperate for something really creative, fresh and surprising to leap out from the screen. So originality is key.

» BE INSPIRED – BUT DON'T COPY By all means look at past winners of the competition for inspiration. But don't copy. One mistake many people make is attempting to replicate previous winners. That's a bad idea, and simply increases the chances of your hard work being put straight into the 'seen it all before' file.

» CHOOSE YOUR SUBJECTS CAREFULLY Pictures of common and familiar species often stand a better chance of winning because they tend to be taken for granted and so there is more opportunity to surprise. Popular subjects, such as lions, tigers and elephants, demand extra-special effort because anything too obvious will have been done many times before.

» EDIT RUTHLESSLY It's all too easy to become emotionally attached to certain images, and this is when people enter 'almost' shots. Resist the temptation. Just because a picture was taken on a once-in-a-lifetime holiday at 4am while you were waist-deep in a malaria-infested swamp doesn't necessarily mean it's any good.

» ASK FOR HELP The trick is to make an initial selection – ideally two or three times as many as you are allowed to enter – and then get other people to comment. They don't have the emotional attachment that makes it so hard for you to separate your favourites from the really good shots.

» ENTER THE RIGHT CATEGORIES You stand a better chance of winning in categories that tend to get fewer entries. In particular, try entering Behaviour: All Other Animals, Urban Wildlife, In Praise of Plants and Fungi, One Earth Award and the Gerald Durrell Award for Endangered Wildlife.

» READ THE RULES – AND FOLLOW THEM This may seem obvious, but you'd be surprised how many entries break the rules and, consequently, are deemed invalid by the judges. Reading the category descriptions is just as important. Good luck! *MC*



The Frozen Moment by Fergus Gill wowed the judges of last year's competition.

Fergus Gill/Veolia Environnement WPOY 2010

EVERYTHING YOU NEED TO KNOW TO ENTER THE COMPETITION

THE JUDGES

Mark Carwardine (Chair) Zoologist, writer and photographer
Colin Finlay Head of Image Resources, the Natural History Museum, London
Pål Hermansen Photographer and author
Rosamund Kidman Cox Editor and writer
Sophie Stafford Editor, *BBC Wildlife*
Markus Varesvuo Wildlife photographer
Beverley Joubert Wildlife photographer
Other judges to be confirmed.

CATEGORIES AND PRIZES

Animals in their Environment Images must show how the animal fits into its natural home and convey a sense of place.
Behaviour: Birds
Behaviour: Mammals
Behaviour: All Other Animals
Images must capture a memorable, unusual or interesting behaviour. Judges will look for images with aesthetic appeal, a unique interest value, and a dramatic action.
Underwater World Images must feature marine or freshwater life taken underwater. Supported by Project Aware.
Animal Portraits Portraits should capture the unique character or spirit of the animal. Images should be imaginative and convey intimacy and immediacy.
In Praise of Plants and Fungi Pictures should capture the beauty and importance of plant life in its natural habitat. Judges will look for artistic merit and creativity not just a simple scientific record.
Urban Wildlife Pictures must show wild plants or animals in an obviously urban or suburban environment. Images should be unusual, poignant, beautiful or strikingly composed.
Nature in Black and White Judges will be looking for skilful use of the black and white medium. Dodging, burning and toning are allowed. The subject can be any wild landscape or living organism.
Creative Visions of Nature Judges will be looking for a well-defined thought process, originality and an attempt to convey a deeper understanding of nature through a conceptual vision of the world.
Wild Places This is a category for landscape photographs. Judges will be looking for beautiful light, a true feeling of wildness and a sense of awe. Stitched images and panoramics are allowed.

SPECIAL AWARDS

Wildlife Photojournalist of the Year Award This award is for a memorable story told in six images. All subjects covered by other categories are eligible, from animal behaviour to environmental issues (positive or negative). The story should work without the aid of words and will be judged on the picture quality as well as the power of the story.
Eric Hosking Award This award encourages and rewards the talents of young photographers aged 18–26. You must submit a portfolio of 10 images that represents your very best work.
Gerald Durrell Award for Endangered Wildlife Species (both animals and plants) must be categorised in the 2009 IUCN Red List as Critically Endangered, Endangered, Vulnerable or Near Threatened at an international or national level. Images must be memorable and capture the unique character or spirit of the subject. www.iucnredlist.org. Supported by ARKive.
One Earth Award This award highlights conservation issues or actions. Don't rely on shock value: the judges will be looking for genuine photographic merit. Focus on positive messages as well as negative ones. Images can be graphic or symbolic, but must be thought-provoking and memorable, and must encourage respect or concern for the natural world.
Veolia Environnement Young Wildlife Photographer of the Year Pictures must show wild animals, plants or landscapes. The judges will be looking for original, beautiful or striking shots. There are three age categories:
15–17 Years
11–14 Years
10 Years and Under

PRIZES

The title *Veolia Environnement Wildlife Photographer of the Year 2011* will be given to the single image or portfolio judged to be the most striking and memorable of all the entries.
The winning photographer will receive £10,000, presented at an awards ceremony at the Natural History Museum, London, in October. Each category winner receives £500 and every runner-up £250. Special award winners receive £1,000.
All winning and commended images are displayed in an exhibition at the Natural History Museum, London, and tour the UK and overseas. Pictures are also published in *BBC Wildlife* Magazine and a hardback book.
The title *Veolia Environnement Young Wildlife Photographer of the Year 2011* will be awarded to the young photographer whose image is chosen from the three winners of the age categories. He/she will receive £500 and a day out with a well-known wildlife photographer.
Category winners will receive £250 and runners-up £100.

HOW TO ENTER

The competition is open to all professional and amateur photographers.
For complete rules and categories, more information and to enter visit **www.nhm.ac.uk/wildphoto** or email **wildphoto@nhm.ac.uk**
Translations are available online in Chinese, French, German, Italian, Russian and Spanish.
Images must be digitally captured, or high-quality scans of transparencies (any format).
RAW files or original transparencies and high-res TIFF files will be requested if an image reaches the final stage.
Fee £20. Young photographer aged 17 years and under: free.
Closing date for entries: **Friday 18 March 2011.**

The competition is owned by *BBC Wildlife* and the Natural History Museum, London, and sponsored by Veolia Environnement.

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EXPOSURE

Pretty in pink

The sight of flamingos in the snow is rare and beautiful – but the birds themselves were far from in the pink.

The Camargue wetlands are home to France's only breeding colony of flamingos. Many of the birds also overwinter here, visiting the Pont de Gau Ornithological Park during the day to feed.

Last year, a thick blanket of snow – extremely rare in the region – carpeted the ground. The water froze and the flamingos were unable to feed; some even died of hunger. So staff at the park broke the ice on a small lake, attracting at least 300 individuals, and closed it to visitors to allow the birds some peace. The falling snow on their vivid pink feathers was just magical.

Fortunately, the sun soon returned and the flamingos survived – with a little help from their friends. *Thierry Vezon*

thierryvezon.com

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floral/egg

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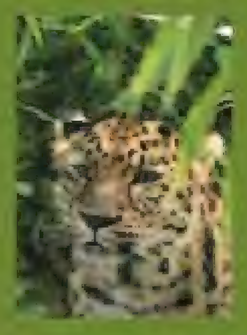
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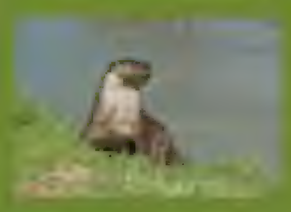
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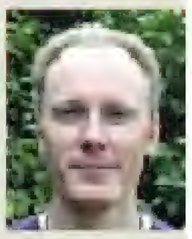
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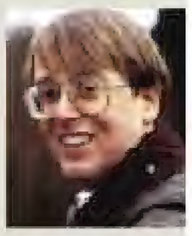
OUR EXPERTS



MIKE TOMS
Mike is head of garden ecology at the British Trust for Ornithology. He has written and co-written several bird books, including *BTO Garden Birds and Wildlife*.



TONY COOK
Tony works at Ulster University. He is a member of the Malacological Society of London and an expert on the behavioural ecology of terrestrial molluscs.



STEVE HARRIS
Professor of biological sciences at Bristol University, Steve is one of the UK's leading mammal experts as well as a regular contributor to the magazine.



STUART BLACKMAN
Stuart started out as a zoologist, with a PhD in evolutionary biology, and now works as a writer specialising in biology and the environment.



PETER MARREN
Peter is a natural-history writer and all-round naturalist with a special interest in fungi. His books include *The New Naturalists* and the recent *Bugs Britannica*.

WE'D LOVE TO HEAR FROM YOU

SEND YOUR QUESTIONS TO
Q&A, *BBC Wildlife*,
14th Floor, Tower House,
Fairfax St, Bristol BS1 3BN
OR EMAIL
wildquestions
@bbcmagazines.com

We are very sorry, but due to the high volume of questions we receive, we are not able to acknowledge or answer any personally.

Steering starlings

Why are starling flocks so much larger than those of other birds, and how do they co-ordinate their movements so well?
Leslie Johnson St Helens



This swirling, smoke-like mass of starlings is one of the UK's most stunning winter spectacles.

Laurie Campbell

The large flocks you describe are very much a feature of the winter months, when small groups of starlings coalesce before the birds descend into their chosen roosting site. Such aggregations, known as murmurations, come about because of the limited number of suitable places for the birds to spend the night during winter.

Individual starlings use the crowd to minimise the risk of being taken by the predators that patrol the area around established roosts. Large flocks of waders are also seen in winter for the same reason.

The cohesion of the flock is important, since stragglers and isolated groups are at greater risk of predation than a bird within a larger mass. Stereo photography has revealed how individual birds adjust their position within the flock without collision. Each starling reacts to the movements of its neighbours, typically interacting with six or seven other birds at varying distances – not just the ones closest to it. Every starling is responding to subtle changes in the flight of the others under its surveillance. Each change in direction is therefore passed from bird to bird, sending waves pulsating through the flock that give it the eerie appearance of having a life of its own.

Mike Toms BTO

DID YOU KNOW?
In 1949, a large flock of starlings perched on the minute hand of the clock on Big Ben in London. The birds' combined weight slowed the clock by 4.5 minutes.

Slug drug

A friend told me that slug slime is an anaesthetic – and if I licked it, my tongue would go numb. Is this true? If so, how does having numbing slime benefit the slug?
Emre Yurdakul London

Michael Hutchinson/naturepl.com

The idea that the slime of land snails or slugs has medicinal properties is an ancient one. Pliny the Elder, for example, suggested treating burns with snail pulp. In more recent centuries, concoctions of snails brewed with wine, milk, salt or sugar have been used to treat ailments ranging from nephritis to vertigo and whooping cough to madness.

Slime does have some active ingredients. It is certainly antibacterial and also contains substances that will relax the bronchi. Using snail mucus on a burn should therefore reduce infection and protect the wound from drying out.

Similarly, in the treatment of lung complaints, a covering of mucus protects inflamed areas and keeps airways open. As for its anaesthetic properties, this seems unlikely and any effect is probably due to lubrication: covering the taste buds might stop them working, appearing to deaden the mouth.

Anyone considering testing this should remember that snails and slugs carry the intermediate stages of human parasites – so I would definitely not recommend it!

Tony Cook Malacologist

Slug slime: lick at your own risk.

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Your Q&A...

Cryptic cats

I recently found an old book about big cats. The chapter on endangered species included some animals that I had never heard of, such as the Anatolian leopard, the Florida panther and the Asiatic cheetah. Do any of these cat species still survive in the wild?
AM Choudhury Lichfield



As this 19th-century engraving shows, trained Asiatic cheetahs were used to catch gazelles during Indian hunting parties.

The Print Collector/Alamy

These are not cat species but subspecies or races, each restricted to a certain range, and some do survive. The Anatolian leopard is named after the Turkish region where it was first described, though it may once have spread further west along the Mediterranean: a leopard is depicted in a 30,000-year-old cave painting in southern France. While there is little evidence of its continued survival, a few individuals may hang on in remote areas of Turkey.

To the east, the Persian leopard subspecies survives, though it is a rare sight. The Barbary leopard also occurs in small numbers in the Atlas Mountains of North Africa, with a few living in Egypt.

The Florida panther is a type of cougar that lives in the swamps and forests of southern Florida. No more than 100 persist in the wild, despite extensive attempts to boost their numbers.

The Asiatic cheetah is also in a pretty parlous state: it used to be found from Arabia to India. The word *cheetah* is actually of Indian origin. India's last wild cheetahs were shot in 1947 by the Maharajah of Surguja, and today only about 50 Asiatic cheetahs survive in Iran, with rare sightings in Pakistan.

Steve Harris Mammalogist

DID YOU KNOW?
The Barbary lion became extinct in its wild range in North Africa in 1922. However, many members of this subspecies were kept by zoos and circuses in the 19th century, and it is possible that their descendants survive in captivity.



Colour-detecting cone cells show up blue in this electron micrograph of the human retina. Green rod cells, used in night vision, perceive only shades of grey.

Omikron/Science Photo Library

The eyes of the beholders

Which animal sees colours most like humans? Would a moose see a green-leaved tree or an octopus a red-and-white clownfish the same as us?
Mia Osgood King's Lynn

Our perceptions of colour are labels we attach to light of particular wavelengths. To find out if all animals use the same labels, we would need to see the world through their eyes and brain – a tricky experiment!

We can be sure, however, that an octopus will not see a red-and-white fish like we do, because octopuses do not have colour vision. Humans detect colours using three sets of cone cell in the eye, which are sensitive to red, green and blue light (trichromatic vision). Differential stimulation of the cone types allows us to detect all the colours of the rainbow. Most mammals (and colour-blind people) lack at least one cone type, making some colours indistinguishable to them. Birds, meanwhile, have an extra one, and can also see ultraviolet.

It is probably our closest relatives that see the world most like we do. Apes have trichromatic vision, which enables them to identify the ripest fruits and freshest leaves, and process the visual information with brains built along similar lines to ours. They also have forward-facing eyes providing binocular vision.

Stuart Blackman Science writer

DID YOU KNOW?
Some biologists have speculated that echolocating bats might hear in 'colour', attaching colour labels to the sounds that bounce back from different surfaces.

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STRANGE BUT TRUE...

Macho millipede





Repel boarders! The porcupine-Velcro millipede uses its bristles to entangle predators such as this ant, *inset*.

IT MAY BE smaller than a grain of rice, but the porcupine-Velcro millipede *Polyxenus fasciculatus* is one tough cookie. When assaulted, often by an ant or spider, it turns tail but doesn't run. Its rear end is equipped with two tufts of microscopic bristles, each shaped like a grappling hook. As the millipede pivots, it splays these weapons and swipes them against its assailant. Many of the bristles snag on the hair-like setae on the insect's face and front legs, and are pulled free of the millipede as it flees.

These weapons then do the rest. The shaft of each bristle is covered in hook-like barbs that further entangle the attacker as it tries to brush them off. The loose bristles interlock in a similar fashion to Velcro, acting like a self-assembling net. After a few moments of struggle, the aggressor finds itself hog-tied and left to die.

The millipede never runs out of ammo. It has enough bristles for multiple attacks, and its full arsenal is renewed at every moult – in fact, using them may spark moulting.

The tactic almost never fails in this North American species. But closely related millipedes in Brazil and Central America that use this same defence have met their match.

Thaumatomyrmex ants have evolved long, smooth, pitchfork-like mandibles, which they use to trap and hold their prey at a distance. The captive's tufts, too short to touch the ant's face, are rendered useless. The predator then kills with a sting of venom, carefully strips its 'coat of arms' and enjoys the meal. David Butvill

DETACHABLE DEFENCES

» Other creatures also use detachable bristles for defence. Some species of tarantula drag a leg across their backs, which fires a barrage of tiny spears into predators' eyes.

» Some caterpillars use defensive bristles in a different way. They remove them from their bodies and arrange them on their cocoons for protection while they metamorphose within.

» Moth wing scales detach easily, helping them to escape from sticky spiderwebs.

» The porcupine-Velcro millipede also boasts another amazing survival tool: an organ on its back absorbs water from the air during severe drought.

Main: Alex Wild/alexanderwild.com; inset Thomas and Maria Eisner/Cornell University

QUICKFIRE

In your October issue you showed a whooper swan without any tail feathers flying (p6). Are its feet serving as an aerodynamic substitute?
Nicholas Sawyer Via email
Tail feathers do not provide lift, but help with stability and manoeuvrability. The rather stubby tails of swans probably play only a minor role, but this bird may well be using its feet to mimic the missing feathers. The feet could also help to balance the centre of gravity, a role they are known to play in other species. Mike Toms BTO



These wart-like lumps are parasitic scale insects.

Robin Chittenden/FLPA

I'm told that the small lumps on my tree are insects. Is this true?
Catherine O'Keefe Derby
These are scale insects, related to aphids, but specialising in sucking sap from branches and stems rather than from leaves. Males have wings and look insect-like, but females are wingless; each is little more than a broad shield covering an immobile body. Immature 'crawlers' migrate to the leaves to feed, but settle on the trunk as the leaves fall in autumn.
Richard Jones Entomologist

Can fish drown?
Freya Clarke Via email
According to *Collins Concise Dictionary*, drowning is "to die or kill by immersion in liquid" – so no, fish cannot drown. However, they *can* suffocate – when fresh water does not contain enough dissolved oxygen, due either to eutrophication (an excess of nutrients) or drought. Out of water, a fish's feathery gills stick together, reducing the space available for gas exchange, resulting in suffocation.
Matt Doggett Marine biologist

Rooting around

We found this spiky fungus in a woodland clearing and on a lawn on the Isle of Mull. What is it?
Ethne Whitlock Isle of Wight

This is, in fact, not a true fungus but a dog lichen – a member of the genus *Peltigera*. Unlike mushrooms and similar fungi, which obtain food and energy by breaking down organic matter around them and absorbing the nutrients released, lichens manufacture their own food, as do green plants.

They do this by forging partnerships with microscopic green, orange or, in this case, blue-green algae, which form a coloured layer within the leaf-like thallus. This independence enables lichens to grow on rocks, tree bark and bare ground, so long as there is sufficient light. Thanks to its relationship with blue-green algae, *Peltigera* can even 'fix' the nitrogen gas it needs straight from the air.

Dog lichens are named after the tooth-like 'roots', or rhizines, on the underside of the thallus. These are not true roots, but simply anchor the lichen to its substrate, in this case sandy soil. According to ancient lore, these 'canine teeth' were a sign that the lichen could cure a bite from a rabid dog.

This image probably shows *P. membranacea*, which is common in grassy areas and can occur on badly drained lawns. Papery in dry weather, it swells up and deepens in colour after rain.
Peter Marren Naturalist



The spikes seen here on the underside of the fronds anchor the lichen to the ground.

Ethne Whitlock

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W2

Everything you need to enjoy wildlife more

Plains zebras graze under the pink-washed skies of a Masai Mara sunrise in this stylish shot by Alex Bernasconi.





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GREAT MIGRATIONS

BOOK OF THE MONTH

By KM Kostyal

National Geographic, 304pp, £19.99

ISBN 9781426206443 (hb)

A fabulous exploration of the drama of animal migration.



Modestly billed as the 'Official Companion to the National Geographic Channel Global Television Event', this glossy book largely lives up to the hype.

Kostyal's engaging prose may verge on breathless at times (and the American English may annoy some readers in the UK), but she does a superb job of conveying the wonder and drama of animal migration. The variety of species included is excellent, too – there are plenty of scaly and chitinous migrants here, as well as the better-known examples with fur and feathers.

As with the recent blue-chip tv series, the highlight of this volume is the jaw-dropping, high-octane imagery of animals swimming, trekking, scurrying or simply floating – going with the flow, as it were. The designers have stitched together series of photos to create double-page spreads that tell the story of each migration from start to finish – this may upset some wildlife photography purists, but the result is undeniably effective.

My main reservation is that Kostyal's definition of migration is rather broad – she stretches the biological concept too far in order to justify including as wide a range of habitats and species as possible. Frugivorous animals searching for ripe figs in the tropics, such as orangutans, travel heavily but are not truly migratory.

Aside from this quibble, the book is a treat: a lavishly produced, well-researched introduction to a fascinating subject.

Verdict ★★★★

Ben Hoare Features editor, *BBC Wildlife*

BBC WILDLIFE SHOP

Reader price £17.99. Subscriber price £15.99. Code W0211/05

ICE BEAR: A NATURAL AND UNNATURAL HISTORY

By Kieran Mulvaney

Hutchinson, 272pp, £18.99

ISBN 9780091926106 (hb)

A heartfelt, insightful tribute to an icon of both the Arctic and climate change.



This excellent book – a blend of natural history and personal reflection – is full of profound observations about one of the world's most telegenic yet threatened mammals.

Mulvaney covers the biology of polar bears in detail, but the most interesting passages are where he discusses their icy homeland and

Alex Bernasconi

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STAR RATINGS

★★★★★ Excellent – a classic
★★★★ Very good – some outstanding
★★★ Good – definitely worth a look
★★ Fair – disappointing
★ Poor – not worth the time



WILD AFRICA

by Alex Bernasconi

Sweeping panoramas are matched with intimate close-ups of big game in this sumptuous coffee-table volume. Giant orange dunes are thrown into sharp relief by the setting sun, while pin-sized hippos wade through vast green swamps. Closer to, blood dries in sticky clumps on a lion's mane and you can count the hairs on a chimp's chin. Bernasconi's spectacular photos (in both colour and black and white) remind us of the variety of this great continent, though the brief text leaves us wanting more.

BBC WILDLIFE SHOP

RRP £34.99. Reader price £32.99. Subscriber price £29.99. Code W0211/01

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The making of humanity



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BBC Books, 288pp, £24.99
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ORIGINS: HUMAN EVOLUTION REVEALED

By Douglas Palmer
Mitchell Beazley, 256pp, £29.99
ISBN 9781845334741 (hb)

Two landmark volumes focus on the planet's most successful and inventive species – us.

Together these books tell a vivid story of the human species from its origins 19 million years ago to our terrifyingly rapid spread across the planet today. Both are lavishly illustrated and a delight to browse through.

I cannot forget the photos in *Human Planet* of Ladakhi families making the six-day trek from their Himalayan valley down the frozen Zanskar River to take their children to school; nor those of a family in the harsh Gobi Desert, the father sitting outside on his Bactrian camel, while inside their mobile 'ger' home two youngsters care for lambs while playing computer games; nor the extraordinary feats of the Khasi people in north-east India, who sculpt bridges from living tree roots to help them cross foaming rivers swollen by the monsoon.

The most stunning pictures in *Origins* are facial reconstructions of the 12 ancestor species preceding *Homo sapiens*, from *Proconsul africanus* (who lived in Africa 19–20 million years ago) to *H. neanderthalis* (who looks very human indeed). Family trees are constructed using molecular clocks based on measures of genetic distances to explain our common ancestry with chimps and other apes, as well as relationships with our ancestors and the multitude of living human groups that evolved since we left Africa 60,000 years ago. Maps show how one extraordinary species came to explore the entire globe and populate its most inhospitable locations.

Perhaps understandably for this type of book, the text of both can be a little anodyne; serious controversies are glossed over rather than properly explored. Yet the problems of overpopulation and climate change lurk in both.

Human Planet suggests that we are at a crossroads on our path towards global domination, while *Origins* shows graphically how humans have changed and continue to change every environment on the planet.

Human Planet ★★★☆☆
Origins ★★★☆☆

Dr Susan Blackmore Psychologist and visiting professor at the University of Plymouth

BBC WILDLIFE SHOP

Human Planet: **reader price £22.99. Subscriber price £19.99.** Code W0211/02
Origins: **reader price £27.99. Subscriber price £25.99.** Code W0211/03



Bactrian camels enable herders to survive in the Gobi Desert. Humans have a unique ability to exploit other species.

Timothy Allen

the 'unnatural' history of their relationship with humans – whether native peoples, Arctic explorers or scientists.

It is chastening to think that the bears were still hunted in large numbers until relatively recently – perhaps as many as 1,475 were killed in 1965. Eight years later, an international treaty prohibited commercial hunting, but the species now faces a far worse threat: climate change. Will wild polar bears still exist in 2100?

Verdict ★★★★☆

Vassili Papastavrou Zoologist and conservationist

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Reader price £16.99. Subscriber price £15.99. Code W0211/06

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W2 BOOKS

STOKES FIELD GUIDE TO THE BIRDS OF NORTH AMERICA

By Donald and Lillian Stokes

Little, Brown & Co, 816pp, £18.99
ISBN 9780316010504 (pb)



An easy-to-use photo guide to the birds of North America.

I need to declare a bias at the outset: I am not a fan of id guides that use photographs rather than paintings. Photos seem more arbitrary and limited in what they reveal, with the light conditions or angle of the shots dictating much about their contents. Illustrations, by contrast, have the flexibility to create a generic portrait that incorporates all of a bird's key features in an idealised way.

But if a single photo guide could ever persuade me of the merits of the format, this would probably be it. This is a glorious book put together with loving attention to detail, covering all of the 864 bird species that regularly occur north of the US-Mexico border.

A good number of them, such as the gulls, waders and wonderfully colourful American wood-warblers, are relevant to British-based birders because they can turn up on this side of the Atlantic as migrants or windblown vagrants.

The text is succinct and thorough and the maps are clear, while the included CD featuring the songs and calls of the 150 most common American species is a real bonus. But the true selling point of this book is the images, which are almost uniformly pin-sharp. There are at least four per bird; for more complex species that have several plumage phases there are as many as a dozen to compensate for the limitations noted above.

The only downside of the Stokes' rigorously complete approach is the book's size – it weighs in at a hefty 1.4kg. Nevertheless, this is a superb, good-value field guide.

Verdict ★★★★

Mark Cocker Author and naturalist

Lillian Stokes



A male yellow warbler performs his sweet spring song. America's gaudy wood-warbler family is a birdwatcher's delight.

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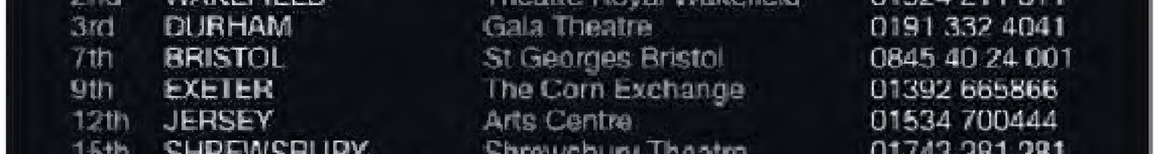
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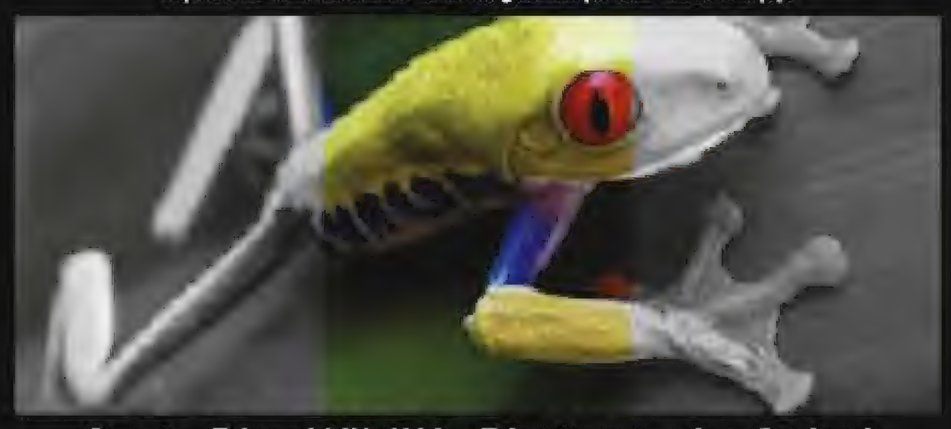
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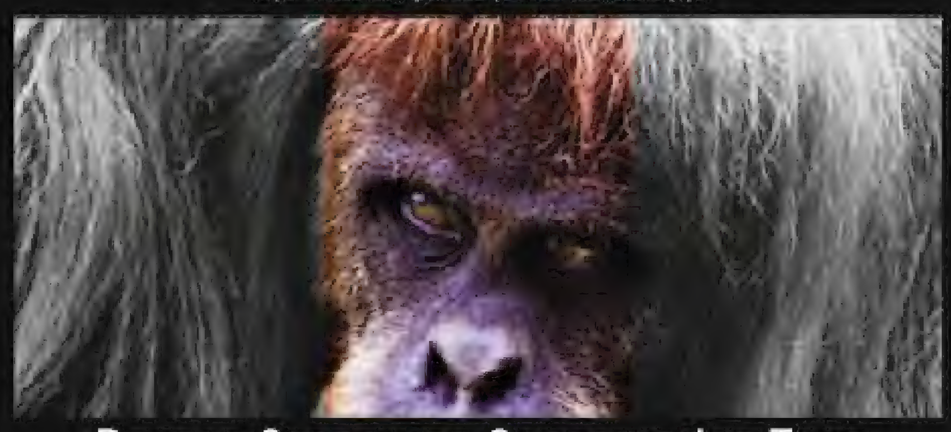
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W2 TV CHOICE



This species of baobab is named after the 19th-century naturalist Alfred Grandidier.

Iraki Relanzon/naturepl.com

PICK OF THE MONTH

Trouble in paradise

MADAGASCAR

BBC2, FEBRUARY (CHECK RT FOR DETAILS)

This three-part series, narrated by Sir David Attenborough, introduces the weird and wonderful wildlife of the oldest island on Earth. Madagascar is a dream location for a wildlife film-maker: about 80 per cent of its species are endemic, having evolved in glorious isolation for millions of years.

Lemurs are the stars of the show, not just because these primates are found nowhere else on Earth, but because of their exceptional diversity. They have evolved to fill every habitat niche, from jungle through saltmarsh to spiky limestone pinnacles known as *tsingy*. Watch out for dramatic sequences of sifakas in the dry south-west, leaping through the air to land, delicately, on viciously spiked plants, where they nibble the hard, tiny leaves among the thorns – their only source of water.

Madagascar is home to a wealth of other extraordinary animals, and the very latest filming technology gives us a ringside seat for some great behaviour – from multicoloured chameleons clambering through the canopy to a nocturnal spider ingeniously hoisting an empty snail shell into a bush with its webbing to use as a hideaway, something that has never been caught on film before.

But, for me, even though we are told throughout that Madagascar is "a place unlike any other", the programme fails to get to the heart of how unique and vulnerable this paradise is. Take the giant elephant bird. This highly successful species became extinct 300 years ago at the hands of French colonists and, today, is a symbol of how the fate of the island and its wildlife ultimately lies in our careless hands. But while we glimpse a beach littered with the glittering fragments of the elephant bird's eggs, we never learn what the species looked like (though a special film following David's quest to find out more about this enigmatic creature is in the pipeline).

We learn how tragic it would be to lose Madagascar's unique biodiversity before we even understand it, but there is not enough explanation of why it is under threat or what can be done to save it. The 10-minute behind-the-scenes films (popular additions to blue-chip wildlife documentaries) reveal how some of the sequences were made, but surely more information about the island's unprecedented habitat loss would be a better use of screen time?

Rachel Ashton

» Join us as we explore this bizarre island and meet its wealth of wildlife on p42.

WILDLIFE HIGHLIGHTS: 20 JAN – 16 FEB

THE BEST OF THE NEW SEASON OF *NATURAL WORLD*

BBC2, FROM MID-JAN (CHECK RT)

A TIGER CALLED BROKEN TAIL

A decade ago, Colin Stafford-Johnson filmed a tiger family in Ranthambore National Park, including a charismatic male named Broken Tail. But in 2003 the young cat wandered from the park and was found fatally injured 150km away near the Delhi-Bombay express a few months later. In this film, Colin undertakes a personal quest to find out why Broken Tail abandoned the sanctuary. He retraces the cat's steps, meeting the people who were incredibly tolerant of an apex predator roaming near their homes, and highlights how urgently tigers need larger protected areas.

MIRACLE IN THE MARSHES OF IRAQ

It's hard to believe that any wildlife still survives in Iraq, considering the country's recent problems. Now engineer Azzam Alwash is attempting the world's largest habitat reclamation project: restoring the Mesopotamian Marshes that Saddam Hussein drained in the 1990s to punish the local tribes for an uprising. *Miracle in the Marshes of Iraq* shows the immense scale and difficulty of the endeavour, but the return of the indigenous and endangered Basra reed warbler is already a huge coup – and hopefully a good omen.

ONE MILLION SNAKE BITES

This documentary follows famous herpetologist Romulus Whitaker's mission to harvest venom from snakes throughout India to make anti-venom. He also tries to convince the people he meets that snakes deserve protection, not persecution – tricky when one million are bitten every year and 50,000 of them die.



A saw-scaled viper has its venom extracted.

Kaylan Varma/BBC

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BEAVERS OF KNAPDALE SCOTLAND

Celebrating the return of the native

A musky perfume, a pile of twigs – the evidence all adds up. European beavers have returned to mid-Argyll after four centuries of absence. **Kenny Taylor** takes a magical mystery tour of their new home.

MY GUIDE SEEMS to be paying homage to a pile of wet sticks. We're at the edge of a small loch, where the water has backed up against a large arc of twigs, mud and leaves. Simon has prostrated himself in front of this structure and is sniffing the ground.

"What do you reckon?" he asks, looking back over his shoulder before resuming the position. Admitting that I'm no expert on odour identification, I join the quest. Kneeling, I press my nose against a mossy stump and inhale. Nothing.

Then, about 1m away, I catch a whiff of something musky. I smile, revelling not simply in the sheer oddity of what we're doing, but in what it signifies.

I've just breathed in something wonderful, something historic. It's a scent mark in the territory of a free-living beaver, the like of which has not graced Scottish air for perhaps four centuries – since the last of the species was hunted to extinction in these waters.

My companion, Simon Jones from the Scottish Wildlife Trust, has a connoisseur's nose for such rare perfumes. He is the project manager of the Scottish Beaver Trial (SBT), the five-year-long scheme that, since 2009, has been using this part of the west Highlands – Knapdale in mid-Argyll – as a test bed for the reintroduction of European beavers to Scotland.

THE SCANDINAVIAN CONNECTION

Enthusiasts of the restoration of certain Scottish fauna have campaigned for many years to see beavers once again splash in Highlands lochs.

I remember over a decade ago chatting with the late Magnus Magnusson, renowned broadcaster and wildlife enthusiast, about how good it would be to welcome Europe's largest rodent back to Scottish waters. "Let's agree to meet in three years beside a Scottish beaver dam, Kenny," he said to me. "And with luck an osprey will be hovering overhead."

Sadly, Magnus didn't live to see beavers return to Scotland; obtaining the – albeit cautious – go-ahead took longer than expected. But I think he'd have relished both the humour and the seriousness of my pause-and-sniff tour.

As we leave the dam, Simon explains that there are now four pairs of beavers living wild in Knapdale. Last summer, a single offspring (called a kit) was born to two of those families, including the one that lives in this loch.

It was a Norwegian member of the team, Christian Robstad, who saw the first Scottish kit. All of the beaver families brought to Scotland were caught by Telemark University College in southern Norway. Christian, who has been part of the project

"I sniffed the scent mark of a beaver – the like of which has not graced Scottish air for centuries."

on both sides of the North Sea, now lives in Knapdale and is employed by the Royal Zoological Society of Scotland, a partner of SBT. He is also an ace beaver-catcher.

Simon reveals how the Norwegian beavers were caught: from a canoe, at night, by the light of strong lamps – a process culminating in a leap into the water with a heavy, hand-held, metal cage to drop over the beaver. I'm glad that, when we climb into the canoe at the shore of Loch Coille-Bharr today, it's in daylight, with almost certainly no need for acrobatic exits.

SWAMP BEAVER

We paddle quietly out into the loch. The shore here is indistinct; water laps at the base of birch and willow



Golden eagles can be seen soaring over Argyll's remote islands and craggy coastline.



Two of Knapdale's beaver families produced kits last summer.

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Loch Sween: Diane Smillie; eagle & stag: Laurie Campbell; beavers: Steve Gardner

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The wooded shores of the Fairy Isles on Loch Sween are the places to head to see redshanks and eiders.





Take to the trail around Loch Coille-Bharr to spot red deer.

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trees in a small swamp. "The beavers created this not long ago," says Simon. "They built the dam we've just visited to control the outflow into a larger loch and the water backed up."

It's a step back in time, in more ways than one, as Simon explains: "This swamp gives an idea of what so many other small wetland areas must have looked like when Britain still had a healthy population of beavers. Most people I've brought here understand the advantages of reintroduction when they see this, visit the dam and find out how beavers can benefit a range of other wildlife, such as dragonflies and young fish, as well as aquatic plants."

"But," he concludes, "you don't need to know the science to appreciate that beavers have added to the beauty of this forest."

Dodging low branches, we continue what, for me, is fast becoming a magical mystery tour, paddling clear of the trees and into the open loch. The canoe glides through the tawny-brown water, past floating waterlily stems and lilypads as large as dinner plates. One of the reasons the SBT chose this place as a release site is that it offers abundant food, such as the lilies, in and around the loch.

I'm being lulled by the gentle rhythm of our progress when I see a dark shape break the surface at the far end of the loch. The creature is 100m or more away, but there's no mistaking the profile, with its massive head and arc of dark-furred back: a beaver.

Keeping my eyes on its silhouette and scarcely daring to speak, I whisper an alert to Simon. He's seen it, too. "I think it might be the male," he says. "He's most likely heard the sound of our paddles and come out to have a look – and to show us that he's noticed us."

The beaver dives, then resurfaces inshore beside a heap of twigs and branches that forms his lodge – the family home where his partner and kit will be snug and hidden. He dives once more, so that he can enter the lodge underwater. This time, he doesn't reappear.

LUCKY SPOT

Our mid-afternoon sighting is a lucky one, since beavers are largely nocturnal, most active from early evening through to early morning. We make a hushed retreat.

A few minutes later, we're back on land, stowing the canoe


The reward for a hike through the oak woods of Taynish is sweeping vistas of Knapdale.

Otter: Elliott Neep; beach: Gordon Doughty; Taynish: Kenny Taylor; tree: Laurie Campbell

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Fine beaches freckle Argyll's coastline, here where Kilmory Burn meets the Sound of Jura.

on the roof of Simon's 4x4. I try to focus on the task in hand but my thoughts keep drifting back to the loch. It has been an afternoon I'll savour for years.

Mid-Argyll is not particularly large if you take a simple measure of it. It's scarcely

"There's no mistaking the profile, with its massive head and arc of dark-furred back: a beaver."

70km, as the eagle flies, from beyond Inveraray in the north-east, south to Tarbert where the 'long and winding road' that inspired the Beatles' song continues down the Kintyre Peninsula. But this part of the West Highlands is, nevertheless, a fitting area in which to launch a project that's likely to be of such long-term importance.

It's about more than size. For the region is huge in terms of historic and prehistoric significance, and has a long coastline, an array of islands large and small, and some of the finest oak woods and boglands in the west Highlands. Tongues of saltwater press far inland along sea lochs, and wood-cloaked promontories jut out to meet the ocean.

Knapdale, in the south of the region, is a great place to appreciate this mix of leafiness and salt tang. Taynish National Nature Reserve, close to Tayvallich, merges these aspects to perfection.

On a day of fast-moving clouds and shifting sunlight, I take to one of Taynish's trails to visit the fringe of Loch Sween, dip my feet in the water and stare



Tree stumps about 1m tall with pointed tops are clues that beavers live in the area.

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Beaver fodder such as waterlilies abounds in Loch Coille-Bharr, making it an ideal spot to release hungry rodents.

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Harrier: Laurie Campbell; beaver: Steven Gardner

out for a while in a fruitless but still enjoyable search for otters.

Turning away from the water's edge, I follow a path rising through an oak wood and cresting the hill at the core of the reserve before dropping back through the trees. A glint of water winks through the woodland; a bird overhead could as likely be a gull as a buzzard.

Trees are covered in mosses and lichens, and polypody ferns sprout from branches – a legacy of the mild climate and the west-coast rains.

For a blast of mid-Argyll's full-on briny aspect, I join Lindsay Johnston, skipper of the *Sea Leopard II*, one breezy afternoon and head out from Loch Craignish with a small group of passengers. Our goal is a close encounter with one of the world's largest whirlpools, which churns between the islands of Jura and Scarba.

Corryvreckan is its name. The title comes from Gaelic; it may refer to the speckling of the water, but as we approach an ominous-looking patch of sea, Lindsay regales us with an alternative story. He tells us how a Viking called Breacan drowned after trying to moor his boat in the maelstrom for three nights – an ultimately fatal bid to win the hand of a Scottish princess.



Winter is the time to head out in hope of glimpsing hen harriers hunting at Moine Mhor National Nature Reserve.

"As we cruise along craggy shores, a trio of golden eagles soars high above."

We edge to the fringe of the roiling water, impressive both for the size of its tumultuous swirls and for the unpredictability of its behaviour. As we turn to cruise on calmer water along craggy shores where wild goats and red deer graze, three golden eagles soar above the nearest ridge.

Water, both fresh and salty, has been a strong feature of this visit. I know I'll come back to savour the heart of the oak woods in summer, when the bouncing cascades of wood-warbler song and soft notes of redstarts will sound across the tree-filled valleys. I'll want to return often to see how the beavers are faring.

THE LONG VIEW

Before I leave, I climb Dunadd, a small hill that rises above the huge bog of Moine Mhor National Nature Reserve. This is where Gaelic-speaking settlers from northern Ireland – the Scotti, whose name was later used to describe the unified country of Scotland – had their power base and coronation site from around 1,500 years ago. It's a small place, but significant. And judging by my experiences in mid-Argyll, that's something it shares with Knapdale still.



Writer and naturalist **Kenny Taylor** was once part of a re-wilding group called The Scottish Beaver Network.

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THE INFORMATION

MID-ARGYLL Dangling from Scotland's south-western fringe, this loch- and-peak-pocked region is packed with natural highlights.

THE NAVIGATOR

❶ MOINE MHOR NNR
Apart from Dunadd Hill, Moine Mhor is mostly an expanse of peatbog. The name means 'The Great Moss' – expect to see plenty of sphagnum moss and the like. Good for hen harriers in winter, breeding curlews in spring and dragonflies in summer. There's a self-guided 600m walk – the Tileworks Trail.

❷ LOCH COILLE-BHARR
The key area to see Knapdale's newest residents, the beavers (or signs of them). A trail encircles the loch but, at the time of writing, the east side was impassable due to flooding. You might also see red squirrels, red and roe deer and otters, plus goldeneye *(below)* and whooper swans on the loch itself.



❸ FAIRY ISLES
At the head of Loch Sween, these six small, wooded islands are in the wider Knapdale Habitat Partnership Area. There's a rich range of flora and fauna here, and down by the shore you might see oystercatchers, redshanks, curlews and eiders *(below)*.





❹ TAYNISH NNR
Oak woods interspersed with grasslands, saltmarsh and shore. Good for woodland wildflowers in spring and rare butterflies such as the marsh fritillary in early summer. Spring birds include cuckoos *(below)*, redstarts, spotted flycatchers and the usual collection of migrant warblers.



❺ CORRYVRECKAN WHIRLPOOL
Not, strictly speaking, a wildlife 'site', but a must for any natural-history enthusiast. It's a huge whirlpool created by the humps, holes and pinnacles (from 29m to 219m in depth) in the strait between Jura and Scarba. Watch for seals and porpoises, bottlenose dolphins *(below)*, white-tailed eagles and, in the summer, basking sharks.



Cuckoo: Pete Cairns/naturepl.com; dolphins: Terry Whittaker/Alamy; eider: Niall Benvie; goldeneye: Laurie Campbell

FURTHER INFORMATION

GETTING THERE AND AROUND
» By train and bus the closest railway station is at Oban, from where **West Coast Motors** runs buses to and through mid-Argyll. ☎ 01586 552319; www.westcoastmotors.co.uk

» **Anderson (IF) Coaches** runs a 425 service between Lochgilphead and Tayvallich (near Taynish NNR), via Barnluasgan (beaver information centre) and, sometimes, Crinan (beside a good oak wood reserve, peaceful canal and overlooking the River Add). Its 426 service ends at Achnamara. ☎ 01546 870354

» Hire a car in Oban or Lochgilphead (the largest town in mid-Argyll). The quiet byways, forest tracks and canal towpaths are good for cyclists, and there are specialist cross-country bike tracks in Knapdale Forest.

Crinan Cycles in Lochgilphead offers short- and multi-day bike hire. ☎ 01546 603511; www.crinancycles.co.uk

ORGANISED TRIPS
» Kenny's visit was arranged by **VisitScotland**, which also has tourist information centres in Oban and Lochgilphead. www.visitscotland.com

» His boat trip was run by **Craignish Cruises**. ☎ 0845 397 9824 (evenings only); www.craignishcruises.co.uk

ACCOMMODATION
» Mid-Argyll has a wide range of places to stay that can be found on the VisitScotland website. Kenny stayed at the **Crinan Hotel**. ☎ 01546 830261; www.crinanhotel.com. Another option is **The Stables** in Achnamara. ☎ 01546 850276; www.thestablesbandb.co.uk

FURTHER INFORMATION
» To find out the latest news from the **Scottish Beaver Trial**, go to www.scottishbeavers.org.uk

» For more information about Moine Mhor and Taynish NNRs, see the **Scottish Natural Heritage** website at www.nnr-scotland.org.uk

» For information about the **Barnluasgan Trail** through Knapdale, visit Forestry Commission Scotland at www.forestry.gov.uk/scotland

» **The Dalriada Project** focuses on wildlife (including black grouse) and cultural projects in the mid-Argyll area. www.dalriadaproject.org



Exploring a swamp made by beavers in Knapdale by canoe.

Kenny Taylor

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In spring, blooms of saxifrage and orchids blanket Sardinia's scrubland habitats – maquis, garrigue and coastal heath, here by the tower at Capo San Marco.

SARDINIA MEDITERRANEAN WILDLIFE

Dragonfly island

The wildlife of Italy's second-largest island mixes the familiar with the exotic, says **Catherine Strong**.

What makes Sardinia such a good place for wildlife?
The combination of varied landscapes and long isolation from the mainland has led to the evolution of a number of endemic species. Coastal lagoons, forests and limestone hills provide habitat for a rich variety of plants, insects and birds. Another intriguing aspect is nanism – you'll encounter subspecies that are smaller than their mainland cousins: red deer, for example.

And why is spring so special here?
Flowers are at their best from mid-March to the end of May – crocuses, cistuses and saxifrages bloom, as do the island's 16 species of orchid. Look for sawfly orchids in garrigue and maquis scrubland habitats, spot milky orchids in the Gulf of Orosei and Gennargentu National Park, and go to Valle di Oridda for man orchids and dense-flowered orchids.

Any other plants of interest?
The club-shaped, leafless *Cynomorium coccineum* parasitises the roots of other plants. It has reputed medicinal properties and was supposedly used to staunch wounds during the Crusades.

How about bird life?
By May, European bee-eaters, golden orioles and nightingales abound inland, while slender-billed and Audouin's gulls are among the many species seen at the coast. Citril finches and spectacled warblers live in Monte Arcosu Nature Reserve, while Barbary partridges can be seen on the Isola Asinara.

What about insects?
Sardinia is rather famous for dragonflies – it has about 35 species, most of which are not found in the UK. Its proximity to Africa means that the island hosts some unusual species, and for the real enthusiast there are regional endemics to look for, such as the island bluetail damselfly.

Which dragonfly and damselfly species are easiest to spot?
Copper demoiselles are simple to find, often lining up four or five in a row on reed stems. In addition, their mating displays are dazzling – look around small streams near Oristano and Alghero in June. If you are walking on dry, open ground by sandy shores and see a dark dragonfly buzzing around your feet, it is probably a banded groundling, a beautiful species more commonly spotted in Africa.

Any interesting marine life?
Bottlenose dolphins are a regular sight, and Sardinia offers some of Europe's finest scuba diving. July to September is the best time: the superb visibility reveals gorgonians, groupers and morays.

TOP SPECIES TO SEE



A colony of ELEONORA'S FALCONS breeds on the Isola di San Pietro in late summer/autumn.

Imagebroker/FLPA



The SARDINIAN TREE FROG is one of two endemic frog subspecies on the island.

ARCO/naturepl.com



The VIOLET DROPWING can be seen all over the main island near still lakes and pools.

E Boitier/Photolibrary.com

NOW YOU DO IT

GETTING THERE

- Airlines serving Cagliari from the UK include British Airways (www.ba.com; from Gatwick), easyJet (www.easyjet.com; from Stansted) and Alitalia (www.alitalia.com; from Heathrow).

LOCAL INFORMATION

- Stay in Dorgali for excursions into the Gennargentu mountains, which are especially rich in plants and butterflies.
- Sassari is an ideal base for exploring saltmarshes and coastal lagoons good for birdwatching and dragonflies. To request information email tur.serv.turismo@regione.sardegna.it or call the Cagliari Regional Tourist Office ☎ +39 070 606280.

TOURS

- You can join researchers from the Bottlenose Dolphin Research Institute, based in Sassari. Projects run from February to November. For details of volunteering options and visits see www.thebdri.com





Doug Pearson/Photolibrary.com

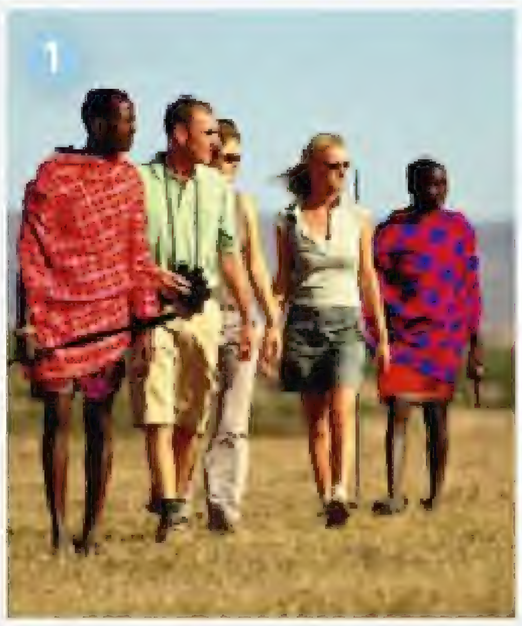
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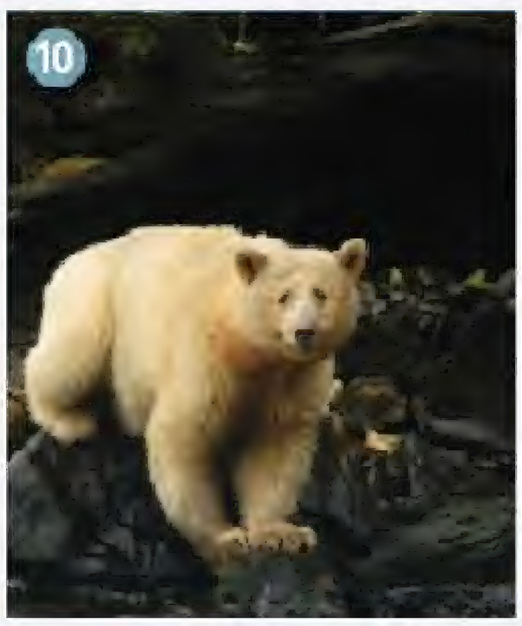


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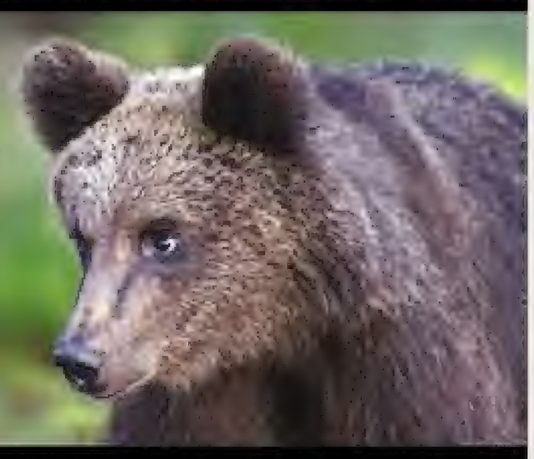
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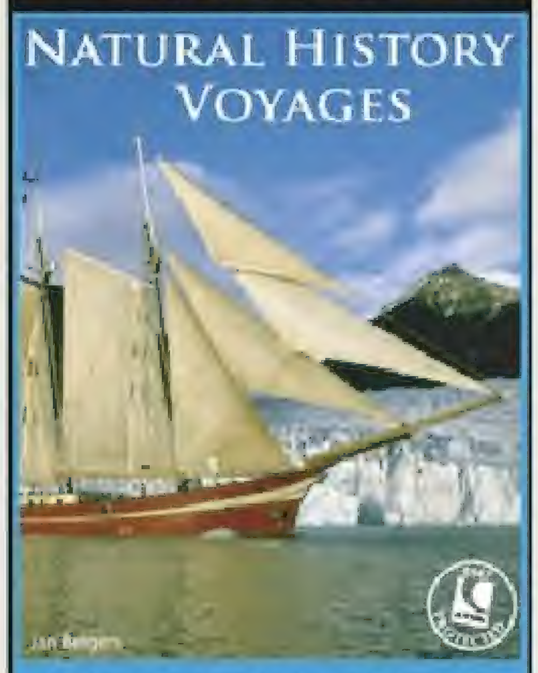
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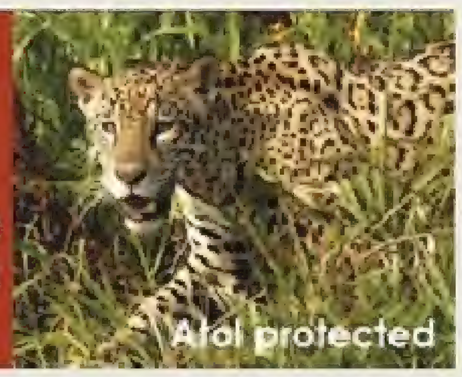
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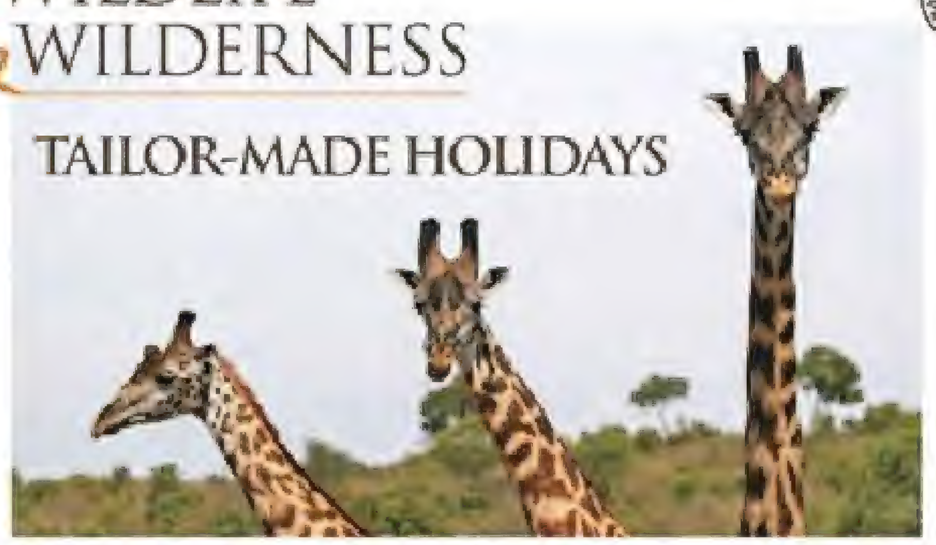
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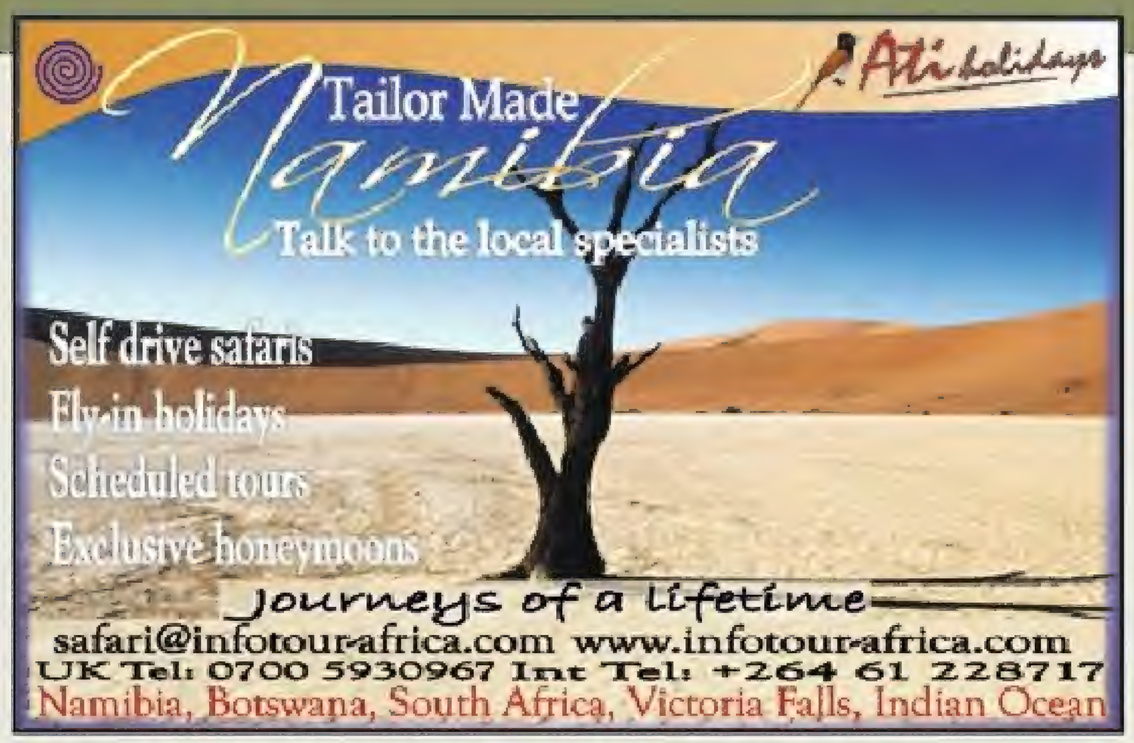
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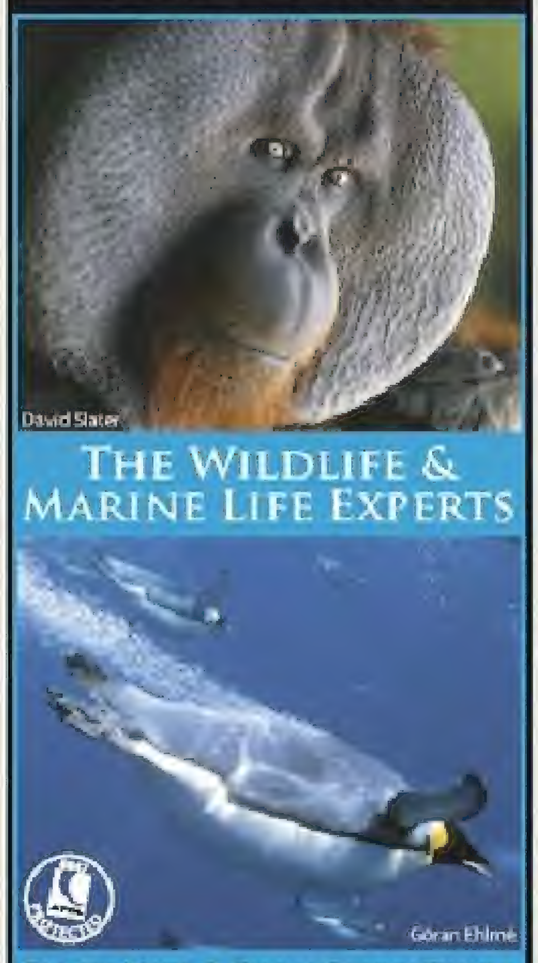
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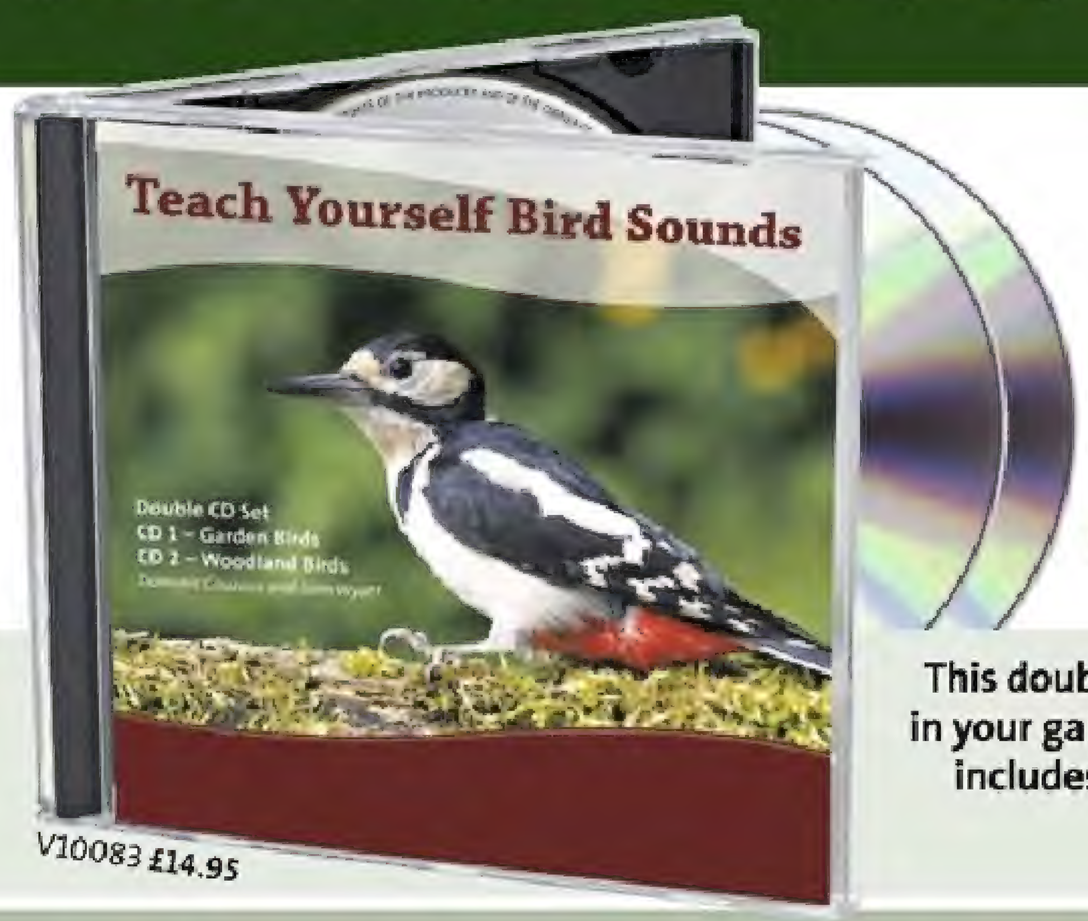
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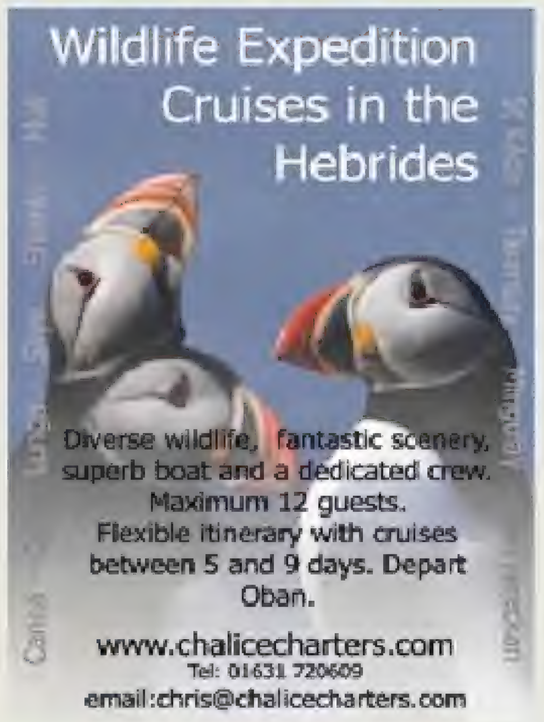
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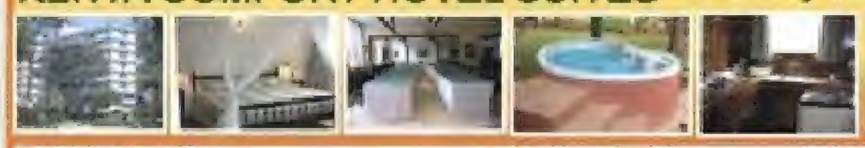


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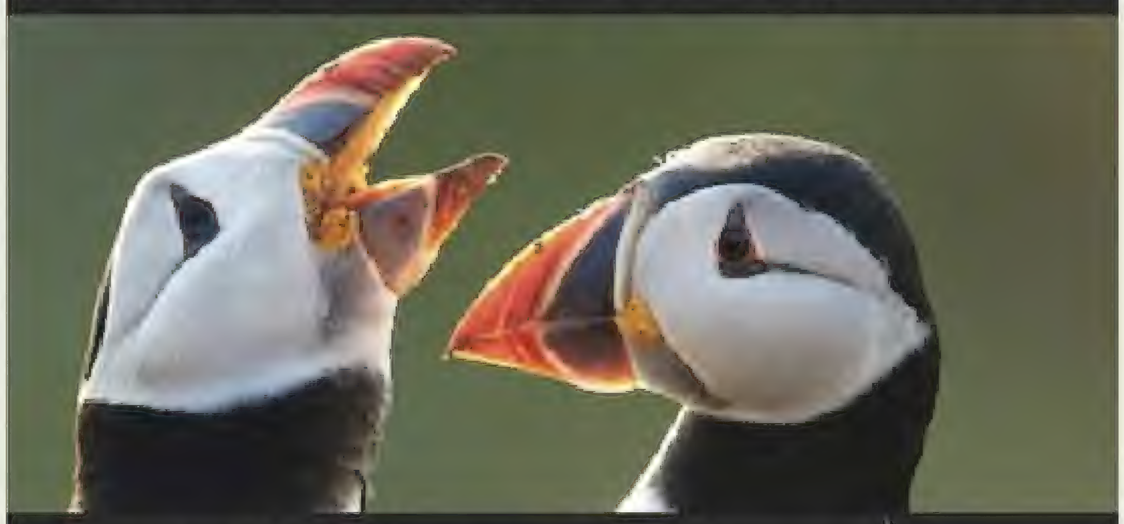
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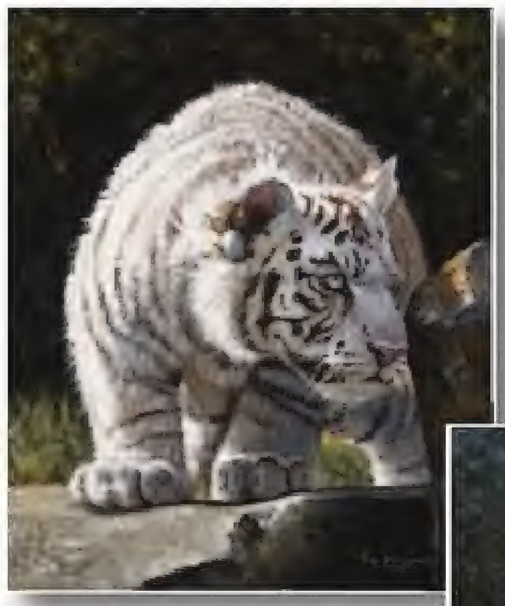
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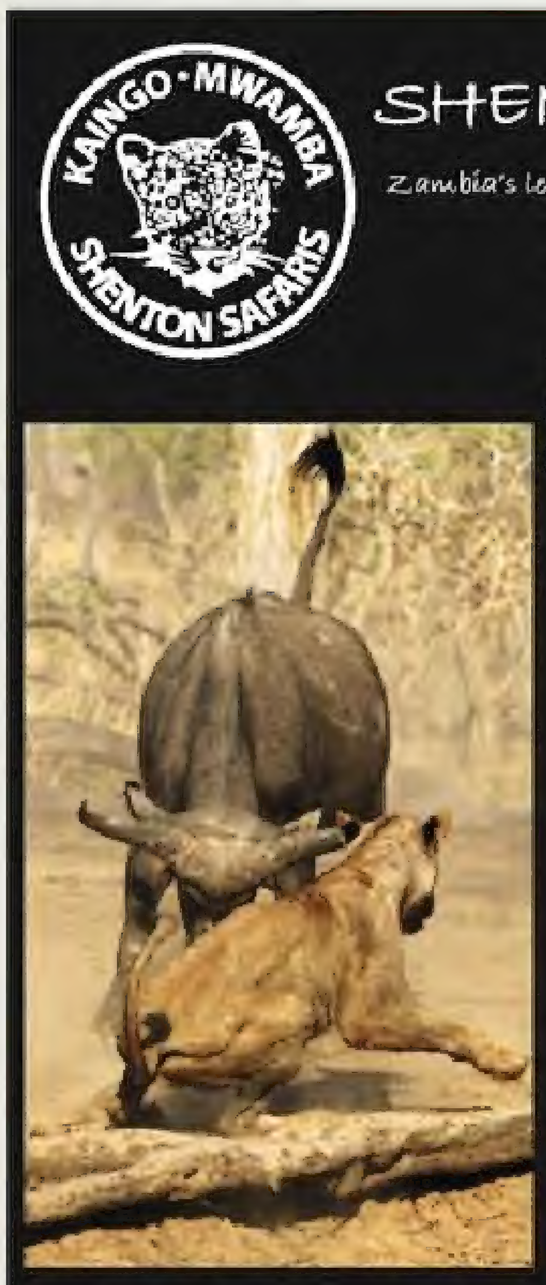
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GIVE CATS A BREAK

I was interested in your feature on the predation of wildlife by domestic cats ('The hunter of suburbia', November 2010). I have two female cats and believe their ilk shoulders too much blame for the loss of birds.

Domestic cats have become part of our ecology, and are no more alien to urban habitats than birds that once lived in woodland. In the wild, small birds are preyed upon by sparrowhawks, buzzards and even crows, but in one year my cats have brought only two blue tits, one vole and a couple of butterflies to my doorstep.

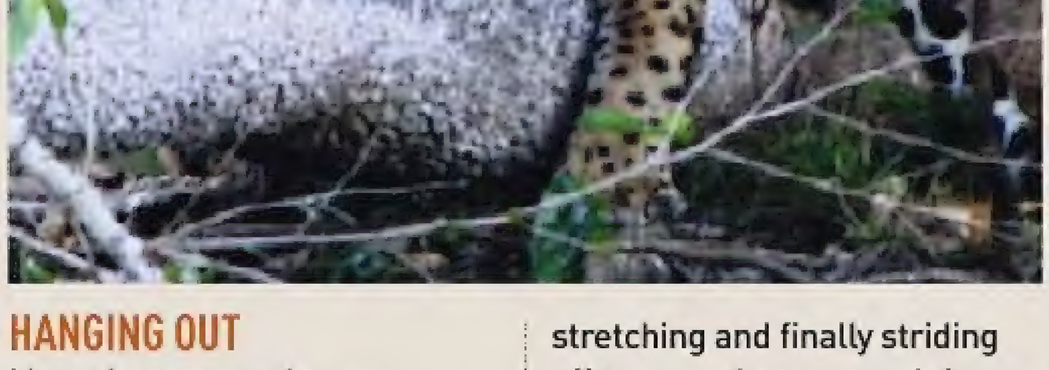
Many factors contribute to the depletion of bird species, such as loss of habitat and our fondness for feeding them which provides cats with dinner on a plate. Our cats are only exhibiting an innate behaviour passed on from their ancestors – they hunt even when well fed. They are just following their instincts.

Shirley Knibb
Wales

A few years ago my late cat, Paws, discovered that our neighbours' three guinea pigs were free to roam their garden. Not only that, but the rodents also managed to burrow under the fence to nibble *my* lawn. Over the next few weeks Paws relentlessly pursued these interlopers, despite being well fed and in defiance of my protests.

Inevitably, he captured the guinea pigs, one by one, until none was left. The moral of this tale is that selective breeding cannot completely negate the cat's genetic inheritance; it is a sublime predator.

Norman Marshall
Via email



HANGING OUT

I have long wanted to see a jaguar in the wild, and we spotted this one on our very first foray into the Brazilian Pantanal on a small boat. He was having a siesta on the river bank, very close to a potential banquet of caimans. We watched him for nearly three hours: sleeping, stretching and finally striding off to a nearby tree trunk for a better view, before disappearing into the trees at dusk.

Elated by the experience, we spent a further three days searching for another jaguar without success, though we did see cub paw prints in the mud.

Sally Leach Romsey

READER LETTER OF THE MONTH

Keep pushing the message

In the *Wildlife Photographer of the Year Portfolio* (distributed with the November 2010 issue), one of the judges' comments touched a nerve with me.

In his assessment of Jordi Chias Pujol's photo *Turtle in trouble*, which won the One Earth Award, Patricio Robles Gil said: "Society has become immune to images of conflict between humans and nature."

We simply cannot afford to think in that way – or, more importantly, to put out such a message. Our aim must be to keep chipping away at wildlife issues at every opportunity as each new generation comes along.

Yes, some people might end up immune, but many others will grasp that nettle if they are given accurate portrayals of cruelty and thoughtless crimes against wildlife.

Dennis Sim
Via email

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BLACKCAPS IN BRUSSELS

Like Jeremy Loftus (Q&A, November 2010), I too have seen a blackcap in my garden during the winter. I live on the outskirts of Brussels and every year blackcaps nest in my garden. It's a pleasure to have them.

In the winter of 2008–9, I noticed a male blackcap on my feeders every day, but no female. He visited for two or three months and was accompanied by numerous tits. I observed many altercations between him and the great tits over peanuts, and he wasn't the least bit aggressive.

Did he stay for the summer or was he replaced by a couple? I cannot say as I have not been able to observe them this winter.

Michel Colard
Via email

DEFENDING BADGERS

In 1978, Greenpeace brought the horrors of the Orkney grey seal cull to the attention of the world. I fail to understand why, more than 30 years later, our government is resorting to the same tactics with regard to the badger cull.

I agree that bovine TB needs addressing, but is there any point in having laws to protect the welfare of our wildlife when a barbaric scheme like this is condoned by our country's leaders? Science is advancing at an ever-faster rate, so surely a bit of patience would be better than eradicating one species to protect another just to be seen to be doing something?

Steve Burgess
East Sussex

FOOD FOR THOUGHT

Watching the recent Channel 4 programmes *Come Dine with Me* and *Four in a Bed*, I was horrified to see that zebra and kangaroo meat were on the menus. I believe that offering these types of meat is ethically repugnant, and begs the questions: where is ▶

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YOUR LETTERS

the meat coming from? And what sort of checks are being made regarding its importation?

Stephen Higgs
Taunton

A CALENDAR QUESTION

As a long-time reader of *BBC Wildlife*, I have always enjoyed the calendar. However, I was disappointed with this year's offering. Though the photos are, as usual, excellent, there is not enough variety.

All of the images are of either mammals or birds – and is it really necessary to have two big cats? On top of this, both your 2010 and 2011 calendars featured zebras and tigers, and a polar bear illustrated both December 2010 and January 2011, which seems like overkill.

The magazine showcases such a range of animals that it's a shame this was not reflected in the calendar. In my opinion the photo of the harlequin shrimps was the best in the 2010 calendar because it was so unusual.

Joanne Riley
Via email

BBC Wildlife editor **SOPHIE STAFFORD** replies:
I'm sorry you were disappointed, Joanne, and that regular readers will have two consecutive months with a polar bear adorning their walls. I just hope that the bears are beautiful enough, and the photographs sufficiently different, to still be enjoyed.

Since this year's calendar had a travel theme, my choices were more restricted than usual. I chose the species we felt most people would travel the world to see, so, sadly, invertebrates were not in the top 12.

Why not let me know what species you would like to see in next year's calendar by emailing me at the address on page 5?

WINTER VARIATIONS

Regarding Alan Leigh's question about an oak tree retaining its leaves in winter when adjacent oaks didn't (Q&A, December 2010), I have also noticed differences in the timing of oaks bursting into leaf and dropping their leaves – one tree may be weeks out of sync with its neighbours.

I have always assumed that the reason involved a natural genetic variation among the species' population, especially if trees are close together and environmental factors are not relevant.

Also, young oaks hang onto their leaves in the winter for longer than older ones. Maybe the tree your reader saw had just retained this juvenile characteristic for longer than usual – this is not unknown in other organisms.

Hilary Gee
Via email

LEARN FROM ALASKA

In Letters (November 2010), Elizabeth Close wrote that some prejudice against ravens remains in Ireland. It's the same here in the Scottish Highlands. The usual response when the species is mentioned is that they are horrible birds that peck out lambs' eyes.

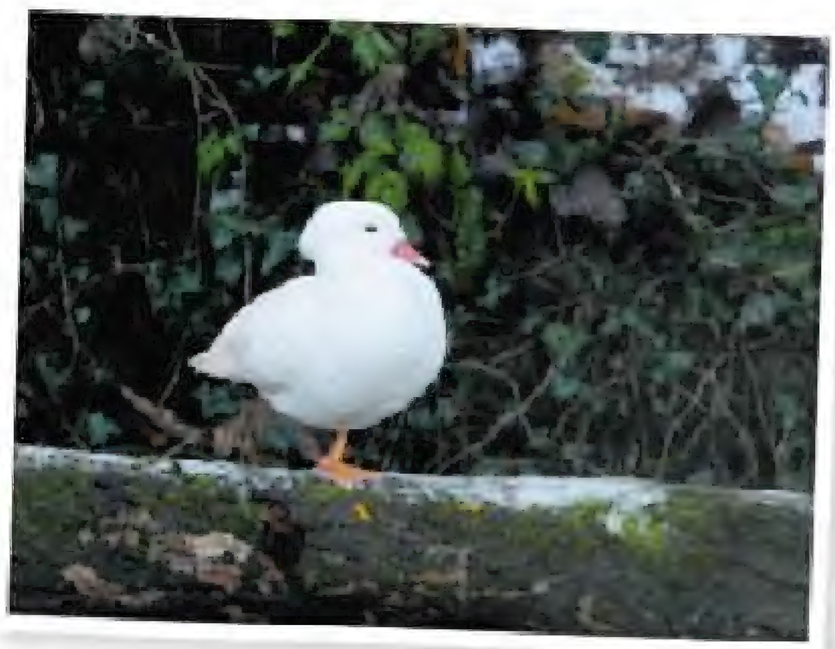
But on a visit to Juneau, Alaska, I found that the locals have a very different attitude. Ravens are part of their folklore, and people are fond of them. There were more of them in the port than any other bird – they hung out in the town centre waiting to be fed their favourite food (french fries), and sheltered from the rain on verandas.

When we walked up the hill behind the town, several ravens kept up with us. Their musical, bell-like 'tonking' echoing among the huge trees was unforgettable. One shop owner (and raven enthusiast) was surprised when we told her that in Scotland the birds live on remote hilltops, are rarely seen and make only a harsh cawing sound.

Primrose Brown
Via email

HAVE YOU SEEN THIS BIRD?

One of the delights of a dark December day in north Worcestershire is a count of the resident mandarin flock on the River Severn north of Bewdley. Here, more than 100 birds, from a population that's been established for decades, loaf on the icy rocks at the water's edge, clambering onto fallen oak trunks and bringing an oriental touch to a very English scene.



John Bingham

This year, I noticed a pure-white duck with a pink bill *(above)* among the flock and, after a quick glance, I dismissed it as a farmyard mallard. On closer inspection, however, it turned out to be a near-albino mandarin, probably immature or a female judging by its crest. The bare parts were pink or orange but the eyes seemed to be dark. It wasn't with the flock last winter.

Are white mandarins rare? Have any other *BBC Wildlife* readers seen one, either in collections or in the wild?

Brett Westwood
Worcestershire

HOW TO HELP THE OTTER

I write in reference to the story in Highlights about otters being run over on roads (November 2010). In the Herefordshire and Welsh borders area, people can notify the Environment Agency about dead otters and it will collect and freeze the bodies.

The otters are transported in groups to Dr Elizabeth Chadwick at Cardiff University, who carries out a postmortem on each one. The notifier then receives a report that covers every detail about the animal.

I hope that, despite the credit crunch, this research is still going on. I have submitted about six otters from my area, including males and females with young. In this way their deaths are not pointless, because we gain so much data about the species and the river systems in which they live.

J Cebo
Shropshire



John Parsonage

We asked **ELIZABETH CHADWICK** to tell us more about her work:
Yes, the system is still in place. We collect samples and data from otters found anywhere in England or Wales (more than 200 every year) to investigate their health, ecology and even some aspects of their behaviour.

More than 80 per cent are roadkill, but determining the cause of death is not our main aim. We generate detailed biological information (on population genetics, etc); screen for diseases and parasites that might be of relevance to other animals or humans; test samples for pollutants (thereby using the otter as an indicator of the health of the wider ecosystem); and disseminate information on casualty blackspots in order to help target mitigation and so prevent further deaths.

For more information see www.otterproject.cf.ac.uk. To report a dead otter, call your local Environment Agency office and ask for the conservation/biodiversity officer, or ring 08708 506506.

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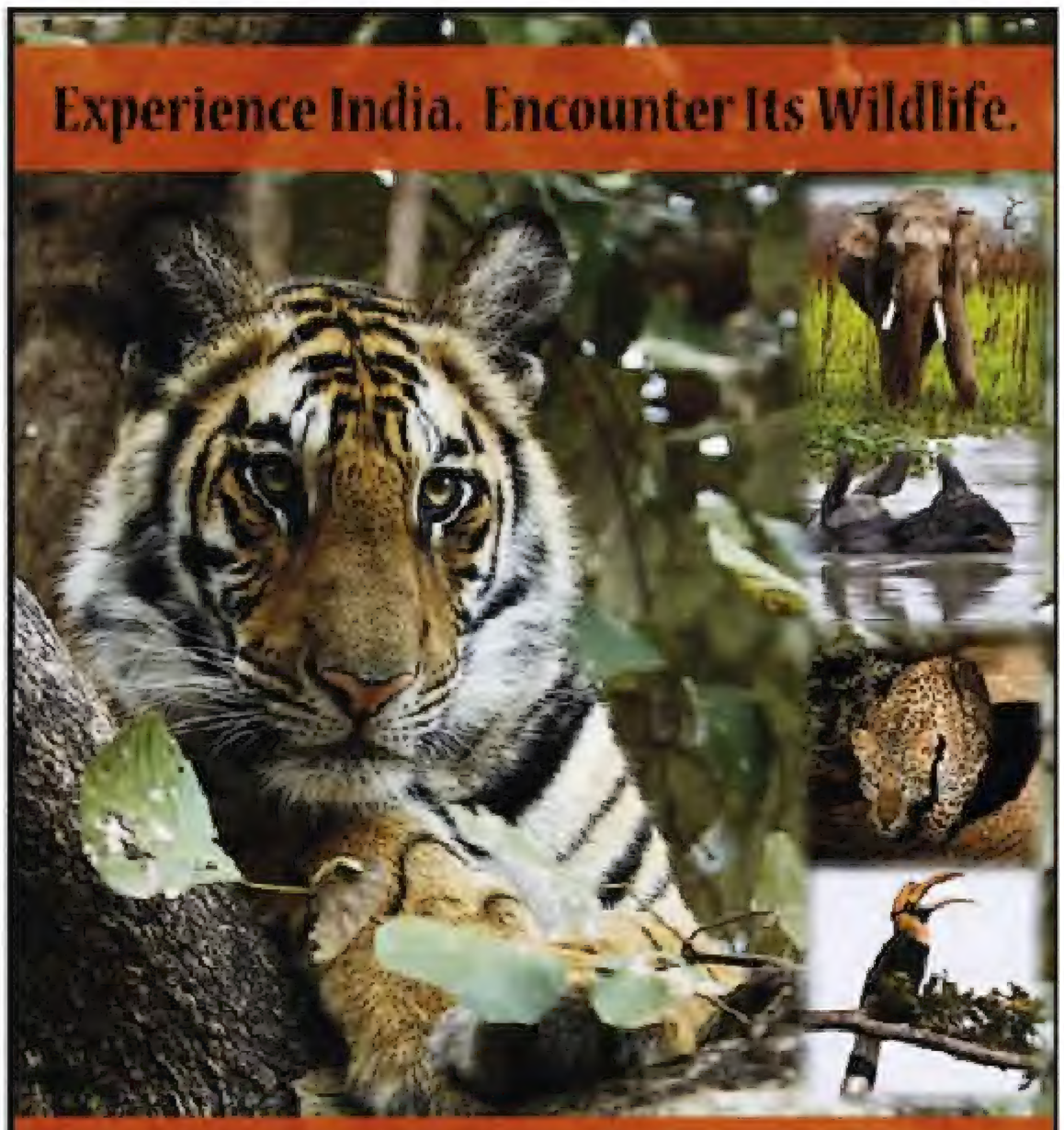
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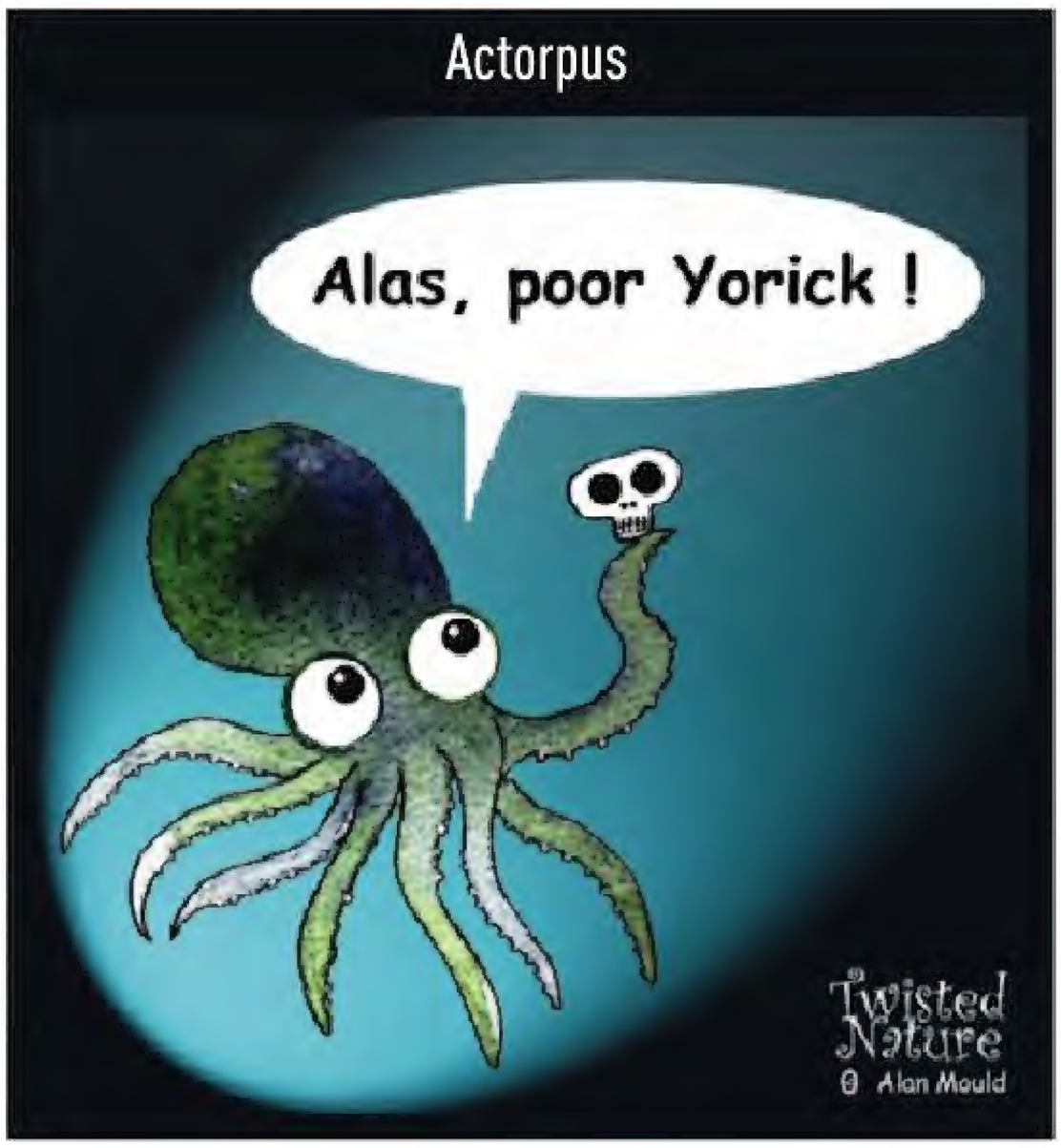
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Alan Mould/www.clikpic.com/amould

THE LITTLE THINGS COUNT, TOO

'A history of the world in 100 natural objects' (November 2010) was very interesting, but perhaps too human-centred, with too much about what's in it for us!

There was definitely not enough about micro-organisms in the article. For example, without saprophytes there would be no decomposition, no recycling and no carbon and nitrogen cycles.

And what about cell organelles such as mitochondria and chloroplasts? Without them there would be no energy release in cells. Finally, where was ATP – the energy-carrying molecule – as common to all life as DNA?

Janice Bridger
Via email

TIME IS RUNNING OUT

The International Tiger Conservation Forum, hosted by the Russian Prime Minister Vladimir Putin in St Petersburg, is over.

But it remains to be seen if the 13 tiger-range countries, together with the backing of the World Bank and conservation organisations, will be able to rescue the wild tigers of Asia from the brink of extinction.

So many times in the past we have heard empty words from politicians on this subject. However, perhaps this time, with the eyes of the world looking on, tiger numbers will double by the next Year of the Tiger in 2022. I can only live in hope!

Michael J Vickers
Tigers in the Forest

ARACHNID ARTISTRY

In Highlights (October 2010), Brett Westwood suggests that the garden spider throws out the longest strands of its web first, but I believe this is incorrect.

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YOUR LETTERS



Bence Máté/Veolia Environnement WPOY 2010

I once accidentally broke some of these long threads, which were up to 14m long, and I watched how they were replaced.

The spider began her work during the day, when the warmer air started to rise. She let out a length of silk that rose up into the air, giving it a tug from time to time to see if it was securely attached. Once it was stuck, the spider tightened it before moving along the thread, spinning another as she went.

At the other end, she fastened it in a slightly different place and then moved back and forth, adding more strands close together, hence the enormous strength of these lines. The rest of the web was created as described in Highlights.

I watched this fascinating process on my patio; it took the spider a couple of hours – and me many cups of tea!

John Hazell
Via email

SMILES AND KISSES

Everyone marks the passage of time by occasions that they look forward to. Two events I enjoy each year are the arrival of the *Wildlife Photographer of the Year Portfolio* followed a few weeks later by the *BBC Wildlife* calendar.

I am unable to pick a favourite from the 2010 competition, but the picture that makes me smile most is *Attention time (above left)* by the overall winner, Bence Máté. How often have two friends stolen a kiss while someone else looks on in envy? It is part of life!

William Burton
Barbados

LAST CHANCE

Don't miss your opportunity to enter the *BBC Wildlife* Artist of the Year 2011 competition. The closing date is 28 February. For more information visit www.discoverwildlife.com/competitions

CORRECTIONS

» Q&A (December 2010) featured a question about a hairy gazelle attributed to Pete Browning. It should have been attributed to Paolo Torchio.

» 'My best ever wildlife Christmas' (December 2010) incorrectly suggested that you can see springbok near Lake Kariba in Zimbabwe.

» In Tales from the Bush (December 2010) we gave the scientific name of the orca as *Orca orcinus*. The correct name is, of course, *Orcinus orca*.

» For a weekly overview of migration movements and bird distributions throughout Britain and Ireland (Highlights, January), visit the BTO's BirdTrack website at http://blx1.bto.org/birdtrack/results/index.jsp?o=BOU_ORDER&r=20

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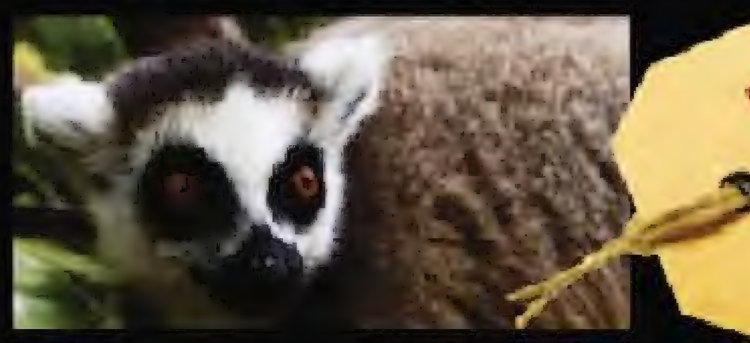
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FLASH LANDING

I took this picture of a blue tit in my back garden, where I had seen the birds landing on this teasel. I used flash lights to freeze the action. There was a lot of trial and error involved, and this image took me all day to perfect. **Austin Thomas** Via email



WELCOME VISITOR

Last year, I grew cosmos in my garden to attract hummingbird hawkmoths. I waited all summer and finally, in early September, I was rewarded with this multicoloured beauty. It didn't hang around for long, but it was worth the wait! **Polly Green** Essex



HOW TO LOOK GOOD

I was taking photographs at Fairburn Ings nature reserve in Yorkshire when this mute swan began to bathe right in front of me. It didn't appear to mind the audience, as it spent quite a while preening its beautiful feathers. **Leanne Mangan** Via email



RIDE THE WAVES

Having taken lots of fairly static penguin photos in Antarctica recently, I was looking for an action shot. At Cuverville Island, the gentoo penguins were porpoising in the shallows, so I staked out the beach to capture the aquatic acrobatics. **David Talbot** Silverdale, Lancashire

FREEZE FRAME



NOISY NEST-BUILDERS

On holiday in Kenya, I found a group of golden palm weavers noisily building their nests near our hotel. Luckily they let me get fairly close, but it took quite a few attempts to get a decent image. However, I didn't begrudge the time – watching these gregarious birds in action was a joy. **Mihali Moore** Via email



While watching the seals at Donna Nook in Lincolnshire, I spied this turnstone feeding its way along the shoreline towards me. **Richard Lane**



In Etosha, Namibia, we saw this cheetah drop its prey and call to a cub. It then slid under a bush, presumably to feed its young. **David Johnson**



I saw this lion in Kenya's Masai Mara in October. He ignored a passing wildebeest; I think he was tired after a night's hunting. **Michael McNeill**

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TOP SHOT



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EDITOR'S PHOTOS OF THE MONTH

RUN, RABBIT, RUN!

I was visiting Amwell Nature Reserve in Hertfordshire when a movement in the vegetation caught my eye. It was a stoat, and it was clearly on the hunt. As I watched, a rabbit burst from cover and bolted down the snow-covered path towards me with the lithe predator in hot pursuit. I managed to get my camera ready and took a couple of shots. The rabbit jinked through a fence, but I soon heard it squeal – the stoat had caught its lunch! **Brian Hewitt** Via email

WIN, WIN, WIN

The photo of the month wins Powertraveller's award-winning powergorilla, a portable charger that gives laptop users 2–5 hours of power and over 20 hours on other 5V devices. The powergorilla works with devices up to 24V, from laptops to mobile phones and iPods, and comes with a mains charger and a host of adaptors. Weighing just 631g, the powergorilla gives you power... without boundaries. www.powertraveller.com





ONE LAID-BACK CAT

We were on our way out of Bandhavgarh National Park in India when we came across this beautiful young male tiger. We were treated to 30 minutes in his company as he paced around in front of us, rolled in the dust and generally took his ease, then we had to drive around him and race for the gates before we were locked in for the night! It was a magical experience we shall never forget. **Caroline Rigg** Bristol



WHOOPS-A-DAISY!

We encountered this herd of elephants in Tanzania's Ngorongoro Conservation Area. This very young calf was staying close to its mother as the rest of its family enjoyed a dust bath. Suddenly the youngster stumbled and fell between the huge legs of its relatives. They were instantly aware of its predicament and helped it up. Despite their size and enormous feet, the calf was never in real danger. **Richard B Barrett** Otley, West Yorks

HOT SHOTS



Yellow-tailed black cockatoos love the introduced radiata pines close to my home, particularly their green cones. The birds often fly over our house carrying cones in their beaks or their feet. Our local golf course is littered with half-chewed debris. **Allen Friis** Australia



A few years ago I visited the Bavarian Forest National Park in Germany. Late one afternoon, I glimpsed this wolf between the trees and quickly took a photo. Everything happened in just a few seconds and then he was gone, but this photo was a perfect end to the day. **Krisztina Dekany** Brighton



The city foxes in Tooting, south London, are really comfortable around humans, and if you approach carefully you can get very close. As you can see, this fox was quite happy to have me only about 1m away, even when I was shooting a flash in his face. **Richard Isaac** London

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ANIMAL BEHAVIOUR

ARRIBADA!

Stunning new photos of the mass nestings of olive ridley turtles in Costa Rica.



Clockwise from top: Angela Scott; David Hosking/FLPA; Solvin Zankl; Tom Bean/Alamy; Christian Ziegler; John Warburton-Lee/Photolibrary.com

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TALES FROM THE BUSH

An encounter with royalty

It's twice as long as you, viciously venomous and eats other snakes for breakfast – there's never a dull moment with India's thrilling king cobra.



When you're catching the world's longest venomous snake, don't get too close...



ANDY WAKEFIELD
Biologist
Karnataka, India

I HAD JUST sat down with a steaming cup of the sweetest *chai* (spiced tea) and was about to tuck into my daily breakfast *dosa* (pancake) when the phone rang at the Agumbe Rainforest Research Station (ARRS). Minutes later, our 4x4 was racing through the rainforest in India's Western Ghats towards a small hamlet a few kilometres away.

We arrived to find the villagers huddled in a courtyard. A king cobra had taken up residence in the attic of one of their homes – and while the world's longest venomous snake was inside, they felt safer outside.

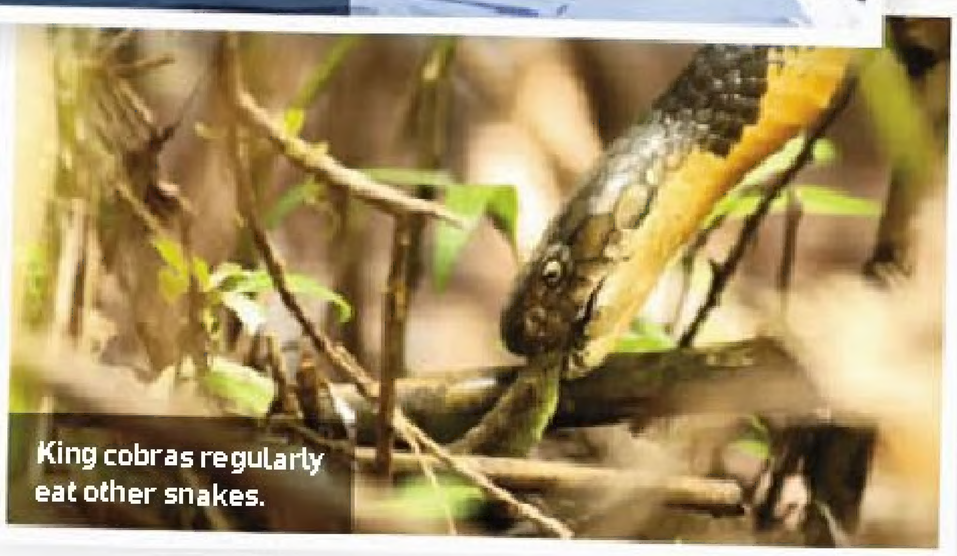
Armed with nothing but a hook, ARRS researcher Gowri Shankar set about waking and capturing the sleeping serpent. These regal snakes are accepted and highly respected in this part of India; however, having splattered its faeces throughout the villager's house, the cobra had outstayed its welcome.

After tiptoeing across the fragile roof and removing some of the weathered tiles, Gowri hauled the 3.6m-long beast from its dark retreat out into the intense Indian sun. Ever since renowned herpetologist Romulus Whitaker founded ARRS in 2005, a team of researchers has been radio-tracking these mighty reptiles come monsoon or shine. Weighing in at a remarkable 8kg, this male was certainly worth tagging.

We took our prize back to the research station and waited a week for him to empty his bowels so that we could operate safely.



The team fits a transmitter under the snake's skin.



King cobras regularly eat other snakes.

Photos by Andy Wakefield

"Having bitten off more than he could swallow, the rogue male had no choice but to regurgitate the half-eaten female."

The thumb-sized radio transmitter we aimed to fit under the cobra's skin would allow us to further investigate the secret world of these mighty snakes. It seemed rather large, but since the reptile was thicker and certainly much stronger than one of my biceps, any fears that it would suffer as a result of the surgery were quickly dispelled. Just half an hour after the anaesthetic had taken effect, the operation was over, the patient had been stitched up and was beginning to tongue-flicker – sitting only about 1m away, this gave me quite an adrenalin rush.

The next day, the fully recovered cobra, now referred to as M4 (being the fourth male to be tagged), was ready to be returned to the wild. Freed from Gowri's grip, M4 turned in the blink of an eye and spread his hood in an ever-impressive final show of his regal stature. Then he effortlessly vanished into the undergrowth. The regular pinging of the radio transmitter slowly faded as he slipped back into his realm.

THIS WASN'T MY first memorable experience with a cobra. Take M2, for example. Until he was studied, king cobras in India were thought to subsist on a diet of rat snakes, kraits and common cobras. But one day I watched as M2 swallowed an endemic Malabar pit viper, which repeatedly bit its attacker's head in a desperate attempt to avoid becoming a snack. Impervious to the viper's potentially lethal venom, M2 gulped it down before setting off in search of a quiet spot for a nap.

But the most surprising discovery made in the course of the ARRS telemetry project came when a tagged female, who went by the name F1, was suddenly set upon by a larger male.

After 40 minutes the 'queen' had been squeezed to death, and the 'king' amazed researchers by attempting to eat her limp body whole, despite her size. Having literally bitten off more than he could swallow, the rogue male then had no choice but to regurgitate the half-consumed female.

It might be a snake-eat-snake world, but sometimes not even the king cobra can stomach the consequences of cannibalism.

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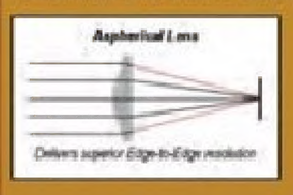
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